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(71) Applicant: Colgate-Palmolive Company
300 Park Avenue
New York, N.Y. 10022-7499(US)

(72) Inventor: Hartnett, Donna A.
30 Pullman Loop
Dayton, New Jersey(US)
Inventor: Patel, Amrit M.
35 Wetherhill Way
Dayton, New Jersey(US)
Inventor: Reich, Charles
247 Karley Street
Highland Park, New Jersey(US)
Inventor: Robbins, Clarence R.
1726 Woodfield Road
Martinsville, New Jersey(US)

(74) Representative: Kearney, Kevin David Nicholas et al
KILBURN & STRODE 30 John Street
London, WC1N 2DD(GB)

(54) Hair conditioning shampoo.

(57) A hair conditioning shampoo is described, which contains C_6, C_8 and/or C_{10} alkyl sulfate and/or C_6, C_8 and/or C_{10} alkyl lower alkoxylate sulfate as an anionic detergent component, a water insoluble conditioning agent(s) from the group of silicones (preferably a certain type of aminosilicone), polyethylenes, paraffins, isoparaffins, microcrystalline waxes, $C_{18-36(mixed)}$ fatty acids or such triglycerides, high fatty alcohol esters of a high fatty acid (such as stearyl stearate), beeswax, cationic conditioning agent, such as a quatenary ammonium or any mixture thereof, and a stabilizer for the shampoo, in water. Among adjuvants that may be present are lauric monoethanolamide, cocodiethanolamide, and hydroxyethyl cellulose, other thickeners and viscosity modifiers, pH adjusting agents, antioxidants, perfumes and colorants. The presence of the C_6, C_8 and/or C_{10} alkyl sulfate and/or C_6, C_8 and/or C_{10} alkyl lower alkoxylated sulfate surprisingly improves conditioning of the hair, compared to shampoos containing other detergents that contain longer chain alkyl groups.

EP 0 413 417 A2

IMPROVED HAIR CONDITIONING SHAMPOO

This invention relates to hair conditioning compositions. More particularly, it relates to shampoos for washing and conditioning human hair, which improve its combability and manageability, compared to ordinary shampoos or shampoos made with "conventional" anionic detergents.

Hair conditioning shampoos are well known in the cosmetic art and are described in many patents and patent applications. Cationic surfactants, such as quaternary ammonium salts, have been employed in hair rinses and in shampoos as conditioning agents, as have been various water insoluble conditioning agents, such as silicones, waxes, greases and oils. Shampoos have been made in different forms, including solid, gel, creme, and liquid forms, and such liquids have been produced as solutions, emulsions, and suspensions or dispersions.

In an application for a US patent entitled Hair Conditioning Shampoo Containing Long Chain Alcohol Component, US Serial No. 507335 filed 9 April 1989, corresponding to EP Application No. Serial No. , there were described shampoos containing lipophile sulfate(s) and a long chain saturated alcohol or "derivative" thereof, as a stabilizing agent, pearlescent agent and conditioning improver. The present invention further improves the conditioning by such and similar shampoos, which improvement was unobvious and unpredictable.

In accordance with the present invention a hair conditioning shampoo of improved hair conditioning properties due to its content of C_6, C_8 and/or C_{10} alkyl sulfate and/or C_6 C_8 and/or C_{10} alkyl lower alkoxy sulfate instead of other anionic detergent, comprises an anionic detergent which is a C_6, C_8 and/or C_{10} alkyl sulfate and/or a C_6, C_8 and/or C_{10} alkyl lower alkoxy sulfate, a water insoluble hair conditioning agent, a stabilizer and an aqueous medium, which may include adjuvants and other components of such shampoos.

A search of the prior art has resulted in the finding of the following U.S. patents:

3,989,500;
4,024,078;
4,470,982;
4,701,322;
4,704,272;
4,707,293;
4,726,944;
4,728,457;
4,731,201;
4,803,237;
4,824,602;
4,850,732;
4,885,130; and
4,859,500.

Also of interest is the Petrolite Corporation brochure entitled Unilin™ Alcohols, copyrighted in 1985 and identified as SP-1040.

Although the art found describes conditioning agents in shampoos and the uses of lower alkyl ethoxy sulfates to remove quaternary ammonium salts and complexes from hair (U.S. patent 4,731,201) and of decyl alkoxy sulfates in liquid detergents to improve cleaning, U.S. patent 4,024,078) there is no teaching in any of the references nor in any combination thereof that would lead one to the present invention or that would lead one to expect to obtain the advantages thereof.

In a broader aspect of this invention the shampoo may be in liquid, creme, gel or paste form and needs only to comprise the C_{6-10} (equivalent to C_6, C_8 and/or C_{10}) lipophile sulfate detergent, the water insoluble hair conditioning agent(s) and the stabilizer in an aqueous medium. In some such forms stabilization, effectable by the presence of a long chain saturated primary alcohol or other suitable stabilizer, may be unnecessary, but its presence may be desirable to obtain other advantages of such compounds, including pearlescing effect and improvement in conditioning.

When cationic surface active conditioning agents are employed they may be considered to be secondary conditioning agents in the invented conditioning compositions. They are preferably quaternary ammonium salts, although other surface active cationic compounds of fiber conditioning properties may also be employed, at least in part. Thus, known amines, amine salts, imidazolinium salts and betaines, and such cationic materials as are described in U.S. patent 4,000,077 may be substituted for at least some of the quaternary ammonium salt, as may be complexes of cationic and anionic surfactants, such as have been described in U.S. patents 4,796,422 and 4,888,119 and in U.S. patent application S.N. 06,616,069,

corresponding to GB Application No. 8723404 Serial No. 2195652.

The preferred quaternary ammonium salts are of the formula:

R^9, R^{10}, R^{11}, R^{12} N^+ X^-,

wherein at least one of the R groups is lower alkyl and at least one is higher alkyl, with the others being higher and/or lower alkyl. Preferably R^9 is lower alkyl, such as of 1 to 4 carbon atoms, R^{10} and R^{11} are higher alkyls of 10 to 40 carbon atoms, R^{12} is such a higher alkyl or lower alkyl, and X^- is a salt-forming anion, such as halide, lower alkosulfate or lower carboxylic acid radical, e.g., chloride, bromide, methosulfate, ethosulfate, citrate or acetate. The lower alkyl will preferably be of 1 to 3 carbon atoms, more preferably being of 1 or 2 carbon atoms, and most preferably, in most cases, will be methyl, and the higher alkyl will preferably be of 10 to 22 carbon atoms, more preferably 12 to 18 or 20 carbon atoms,and most preferably of 14 to 18 carbon atoms, e.g., 16 or 18 carbon atoms.The anion is preferably a halogen, such as chlorine, bromine, or iodine, with chlorine and bromine being preferred and with chlorine being more preferred.

The number of lower alkyls on the quaternary nitrogen will preferably be 1 or 2 and the number of higher alkyls will usually be 2 or 3. It has been found to be desirable to have at least 30 carbon atoms in the quaternary ammonium salt and preferably at least 34. The most preferred higher alkyls are cetyl and stearyl and the most preferred lower alkyl is methyl.The more preferred quaternary ammonium halides include tricetyl methyl ammonium chloride and distearyl dimethyl ammonium chloride, but other such quaternary ammonium salts, are also operative, including dicetyl dimethyl ammonium chloride and tristearyl methyl ammonium chloride, corresponding bromides, amines, amine salts, betaines and complexes of the previously mentioned U.S. patents, which are hereby incorporated by reference. Such alternative cationic surfactants and complexes may be employed as at least part of the cationic surfactant content of the invented compositions. However, it is preferred to use a mixed distearyl dimethyl ammonium chloride and tricetyl methyl ammonium chloride, in a ratio in the range of 0.3:1 to 3:1.

Among the other (primary) water insoluble hair conditioning agents those which are more preferred include organosilicon compounds, such as the dimethicones and silicones (especially aminosilicones), polyethylenes, paraffins, petrolatums, microcrystalline waxes, $C_{18-36(mixed)}$ fatty acids and mixed triglycerides and stearyl stearates (and other higher esters). The organosilicon compounds and the silicones that may be employed include any of those which are hair conditioning agents intended for use in conditioning shampoos, various of which have been described in the previously mentioned patents and applications. They are preferably of non-volatile types. It has been found that aminosilicones are usually more effective conditioning agents in the compositions of this invention than are conventional silicones, and of the aminosilicones the present special types described herein are better yet. Thus, it is much preferred to utilize an aminosilicone of the formula

$$R^2 - \underset{R^3}{\overset{R^1}{Si}} - O - \left(\underset{CH_3}{\overset{CH_3}{Si}} - O\right)_x - \left(\underset{R^4}{\overset{CH_3}{Si}} - O\right)_y - \underset{R^7}{\overset{R^5}{Si}} - R^6 \quad ,$$

wherein R^1, R^2, R^3, R^5, R^6 and R^7 are alkyls of 1 to 6 carbon atoms, and most preferably of 1 carbon atom each, R^4 is - R^8 - NH - CH_2CH_2 - NH_2, R^8 is alkylene of 3 to 6 carbon atoms, and most preferably is an isobutyl group, x is an average number in the range of 1 to 10, more preferably less than 5, and most preferably 1, which is of an amine equivalent in the range of 4,000 to 60,000. Preferably, x is in the range of 200 or 300 to 10,000, more preferably 500 to 10,000, and most preferably 750 to 800 or 850, e.g., about 800, and y is in the range of 0 to 8, more preferably being less than 3 and most preferably being about 1. The amine equivalent of such aminosilicone is preferably in the range of 5,000 to 50,000, more preferably 10,000 to 40,000. For the specific preferred aminosilicone utilized in the experiments reported in this specification the molar percentage of amine is about 0.125, the degree of polymerization is about 800, x is 797, y is one, and the molecular weight is about 60,000 daltons. Because molecular weights of high polymers sometimes vary, depending on the measurement technique utilized, it is suggested that primary reference should be to the formula for identification of the aminosilicones described, rather than placing primary reliance on the molecular weights given. The described preferred aminosilicone is available from Dow Corning Corporation, and it is identified in the working examples herein as Dow Corning Aminosilicone A (applicants' identification).

The polyalkylenes that may be employed as water insoluble conditioning agents in the present compositions are preferably those of a molecular weight in the range of 1,000 to 5,000, more preferably

1,000 to 4,000 and still more preferably 2,000 to 2,500, e.g., about 2,000. Oxidized versions of these polyalkylene polymers may also be used, which create larger hydrocarbons with terminal carboxyl groups. Although the alkylenes of these polymers will usually be ethylene, it is within the invention to employ polymers of hydrocarbons of 1 to 5 carbon atoms each, preferably 2 to 3 carbon atoms, in which the molecular weight range may be from 1,000 to 10,000, or even more, under some conditions. Usually however, the polymers will be of ethylene and/or propylene, and almost always of ethylene.

Paraffins that may be utilized will normally be of chain lengths of 20 to 50 carbon atoms, preferably 20 to 40 carbon atoms, and isoparaffins can be of chain lengths in the range of 12 to 16 carbon atoms, preferably 13 to 14 carbon atoms.The petrolatums are petroleum jellies or mineral jellies which melt in the range of 38 to 60° C. and the microcrystalline waxes are of an average molecular weight in the range of about 500 to 800 (which is about twice that of the paraffins).C_{18-36} fatty acid triglycerides are higher triglycerides which are available from Croda Chemical Corporation under the tradename Syncrowax (HGL-C, for example).. Stearyl stearate, which is representative of useful esters of both higher fatty alcohols and higher fatty acids, is available from Inolex Corporation, as Lexol SS. This and related compounds, such as other higher fatty esters, may also act as stabilizers for the shampoo, preventing settlings out of components and phase separations.

The long chain primary alcohol, which may desirably be included in the compositions of this invention, is preferably a saturate compound, with the hydroxy group being terminally located. Such alcohol will normally be of a distribution of homologous alcohols and typically all are of even numbers of carbon atoms, averaging 24 to 45 carbon atoms (on a weight basis), preferably 28 to 42 carbon atoms, more preferably about 30 to 40 carbon atoms and most preferably 30 to 40 carbon atoms. When the average number of carbon atoms in the chain is less than 24 the desired effectiveness of such alcohols in the present formulations is decreased, with the stabilization, fiber conditioning and pearlescing actions being diminished, and when such chain length is more than 45 carbon atoms, e.g., of an average of about 50 carbon atoms, such alcohols are not satisfactorily dispersible in the described compositions. In addition to the mentioned long chain alcohols, related compounds such as corresponding alkoxylated alcohols, corresponding fatty acids and long chain saturated primary alcohol esters, may be substituted, at least in part. Ethoxylated alcohols are preferred as the alkoxylated alcohols and will normally contain up to ethoxy groups per mole, such as 10 to 20, e.g., about 13 or 15. However, the preferred alcohols normally will be employed alone or in mixture with related compounds from the "derivatives" group, with the alcohol being the major proportion of the final "alcohol plus derivatives" content. Examples of commercial materials which may be employed in the present compositions are those manufactured by Petrolite Corporation and sold through Petrolite Specialty Polymers Group under the name Unilin™ Alcohols, as described in the technical bulletin previously referred to in this specification. Such alcohols may be 75 to 90%, e.g., 80 to 85%, of the commercial product, with the balance being substantially all saturated hydrocarbons of equivalent chain lengths. In such products the distribution curve for the alcohol is substantially bell-shaped, with no chain length of alcohol being more than 10% of the total content thereof, and with the corresponding hydrocarbon content being of a substantially flat distribution curve, with about 1 or 2% of each of the hydrocarbons being present. Such distribution curves, as bar graphs, are given in the Petrolite bulletin previously mentioned. The alcohols (and corresponding hydrocarbons) present will normally be of chain lengths such that at least 80% are in the range of 20 to 54 carbon atoms, at least 80% being in the range of about 18 or 20 to 44 carbon atoms for an alcohol averaging about 30 carbon atoms and at least 80% being in the range of about 28 or 30 to 54 carbon atoms when the alcohol averages about 40 carbon atoms. Examples of the long chain primary alcohols are Unilin-425 alcohol, which averages 30 carbon atoms in its chain, Unilin-550 alcohol, which averages 40 carbon atoms in its chain, and Unilin 350, which averages 26 carbon atoms in its chain. A derivative, Unithox-550, is an ethoxylated such alcohol of an average of 40 carbon atoms in its alkyl chain, ethoxylated with up to 20 ethoxy groups, e.g., 13.

The special water soluble synthetic organic anionic detergent, which is present in the shampoos of this invention, is a lipophile sulfate although lipophile sulfonates of similar types (with only the sulfate being replaced by sulfonate) may sometimes be substituted, at least in part.

The lipophile sulfate of the present invented compositions, which surprisingly improves the conditioning effect thereof, may be either an alkyl sulfate or an alkoxylated alkyl sulfate wherein the alkyl is of C_{6-10} or approximately of (about) 6 to 10 carbons, and the alkoxy is of 1 to 6 carbon atoms, preferably 2 or 3, more preferably being ethoxy, with 1 to 6 ethoxies being present in the alkoxylated compound. Although pure compounds would be desirable they haven't been available at reasonable prices so the alkyl sulfates and the alkoxylated alkyl sulfates are normally mixtures of materials which average C_{6-10} carbon atoms in the fatty alkyl and preferably average 2 or 3 ethoxy groups per mole for the ethoxylated alkyl sulfates. Although broad range ethoxylates (BRE's) are also useful it is preferred to employ narrow range ethoxylates (NRE's)

and one reason for that preference is that they tend to produce shampoos of higher viscosities, which are often desirable. The alkyl group distribution for the alkyl sulfates and for the ethoxylated alkyl sulfates will desirably be such that at least 80% of the corresponding alcohols is in the range of 6 to 12 carbon atoms, with the average being in the range of 6 to 10 carbon atoms, but because many of the starting materials employed are natural materials or are synthesized by processes which do not result in narrow range chain length products, broader distributions are also employable. Similarly, the ethoxylates include at least 80% of the ethoxylated alcohol equivalent within one ethoxy group of that designated, for example, 80% of a 3 EtO product will be of 2 to 4 EtO's.

The salt forming cation of such compounds is normally alkali metal, ammonium or alkanolamine, with sodium and ammonium salts being preferred, especially sodium.

Although it is preferred that the anionic detergent(s) employed should include the hexyl, octyl and/or decyl group(s), it is also within the invention to utilize other anionic detergents with those which are preferred. In such other anionic detergents the lipophile group will include a higher fatty alkyl of 12 to 18 or 20 carbon atoms, such as sulfates and lower alkoxy sulfates, e.g., sodium lauryl sulfate, sodium lauryl diethoxy sulfate, and corresponding ammonium and triethanolamine salts. Also useful are the C_{12-18} alkyl paraffin sulfonates, olefin sulfonates, tridecylbenzene sulfonates and C_{12-16} acyl monoglyceride sulfates. Other such anionic detergents are described in McCutcheon's Detergents and Emulsifiers , North American Edition, published in 1984. Such detergents often contribute significantly to better cleaning power of the invented shampoos, which are illustrated in the Examples.

Additionally, it may be described to employ amphoteric, ampholytic and switterionic detergents in such compositions and sometimes, relatively small proportions of nonionic detergents, and such are also described in such publication. Also, see the description of suitable detergents in USSN 07/432,952, corresponding to EP Application No. Serial No. previously referred to herein.

To make the invented compositions the various required components are dissolved and/or suspended in an aqueous medium. Such medium may include various non-interfering normal shampoo composition constituents known in the art, but a few of these will be specifically mentioned herein because they are especially desirable components of the present compositions and contribute in a significant manner to its desirable properties. Higher fatty alkanolamides have long been known as foaming agents and foam stabilizers. Such compounds will usually be of 12 to 16 carbon atoms in the acyl group, which is reacted with a lower (1 to 3 carbon atoms) mono- or dialkanolamine. In the present formulations the best alkanolamides are considered to be lauric monoethanolamide and cocoethanolamide. However, other known foam stabilizers and foaming agents may also be employed, too, in whole or in part, such as the betaines and related materials. Various gums and other thickening materials are also useful in shampoo compositions but it has been found that the best of these in the present compositions are hydroxyethyl celluloses. Such are available from Aqualon Corporation under the trademark Natrosol, such as Natrosol 250 HHR and Natrosol 330 CS, which preferably are employed in mixture, with the content of the former being from 2 to 5 times that of the latter.

However, other suitable gums and thickeners may also be employed, such as hydroxypropylmethyl cellulose, methyl cellulose, modified starches and guar gum. Another important optional constituent of the present composition is mineral oil, when polyethylene is employed as a hair conditioning agent. The mineral oil is employed to solubilize and to help disperse the polyethylene, which, if not satisfactorily dispersed in the composition, will be of little hair conditioning effect and tends to settle out.

Other components of the present compositions which may be employed include: ethylene glycol monostearate, ethylene glycol distearate and propylene glycol distearate, all of which have pearlescing properties; viscosity control agents, such as propylene glycol and sodium chloride; pH adjusting agents, such as citric acid and citrates; sequestrants, such as EDTA; antifreezes, such as propylene glycol; solvents, such as ethanol and isopropanol; preservatives and antioxidants, such as Germaben II (Sutton Laboratories); anti-dandruff agents, such as zinc pyrithione and Climbazole™ (see U.S. patent 4,867,971); colorants and perfume. Water, employed to make the aqueous medium, but which may be present not only in liquid preparations but also in gels, pastes and cremes, is preferably filtered, irradiated and deionized water of essentially zero hardness but it may also be tap water, although it is preferred to keep the hardness below 50 p.p.m., as calcium carbonate. However, other tap waters of hardnesses as high as 200 p.p.m. will sometimes also be useful, but usually they will be avoided.

The proportions of the various components present in the invented liquid conditioning and shampoo compositions to obtain the described desirable properties will now be given. The cationic conditioner, when present, is in a hair conditioning or conditioning supplementing proportion, which will normally be in the range of 0.1 or 0.2 to 10% or 0.1 or 0.2 to 5% of the invented shampoos, preferably being 0.2 to 3% and more preferably being 0.3 to 0.7 or to 2%. The content of water insoluble conditioning agent(s) (in addition

to the cationic conditioner) will be a hair conditioning proportion or such a proportion which, alone or in conjunction with the cationic conditioner present, serves satisfactorily to condition the hair simultaneously with shampooing, which will normally be in the range of 0.1 or 0.2 to 10%, preferably 0.3 to 7%, and more preferably 0.5 to 5%. The long chain saturated primary alcohol and/or "derivatives" thereof, when present, will normally total 0.5 to 10%, preferably 0.5 to 4%, and more preferably 1 to 3.5%. If another stabilizer is employed instead, such as a higher ester, the same ranges can apply. The content of aqueous medium (which may include various adjuvants) will normally be in the range of 75 to 98%, with the water content of such a shampoo being 60 to 90%, preferably 65 to 85%, and more preferably 65 to 80%. However, the water and aqueous medium contents may be varied, depending on the proportions of adjuvants desirably present in the composition. Normally the ratio of contents of long chain saturated primary alcohol and/or "derivative" to conditioning agent(s) will be in the range of 0.2:1 to 5:1, preferably in the range of 0.3:1 to 3:1, with ratios of 0.5:1 to 2:1 and about 1:1 being more and most preferred, respectively.

In the shampoos the total proportion of detergent, usually anionic detergent or primarily anionic detergent, will normally be in the range of 1 or 2 to 35%, preferably 5 to 30% and often more preferably 5 to 20 or 25%, such as 10 to 20%, e.g., about 15%. Such detergent will preferably be anionic detergent(s) only, and of the weight thereof at least 20%, preferably at least 40%, and in some instances even as high as 70% or up to 100%, may be of the lower molecular weight alkyl group (C_{6-10}) type, as previously described, but even as little as 3% is noticeable.

In one type of the invented shampoo, comprising lipophile sulfate (anionic detergent), quaternary ammonium salt, water insoluble hair conditioning agent and water there will usually be present 5 to 35% of such anionic detergent, preferably 5 to 20 or 25%, which may include, in some formulas, 5 to 18% of fatty alcohol sulfate, preferably as its sodium or ammonium salt, 1 to 10% of fatty alcohol ether sulfate, preferably as its sodium or ammonium salt, 0.2 to 2% of quaternary ammonium salt (which sometimes may be omitted), 0.5 to 5% of water insoluble hair conditioning agent, 65 to 85% of water and any balance of shampoo adjuvant(s). Preferred ranges are 10 to 15%, 1 to 5%, 0.3 to 1.0%, 1 to 3.5% and 65 to 80%, respectively. Such compositions may also comprise 0.2 to 2% of hydroxyethyl cellulose, 2 to 5% of lauric monoethanolamide, and/or cocodiethanolamide, 0.5 to 2% of microcrystalline wax and 0.5 to 1 or 2% of petrolatum. When the described aminosilicone is present its concentration will be in the range of 0.5 to 10% and the amount of long chain alcohol or "derivative" will desirably be in the 0.5 to 5% range.

Other preferred formula types comprise the same proportions of anionic detergents (at least 5% and preferably at least 20% thereof being hexyl-, octyl-or decyl-containing), long chain alcohol or "derivative", cationic conditioner, other water insoluble conditioning agent(s), water and shampoo adjuvant(s) as in the preceding formula but also may include as supplementing conditioning agents, 0.3 to 0.5% of $C_{18-36(mixed)}$ acid triglyceride, preferably 0.3 to 2%, 0.5 to 3, such as 0.5 to 2%, of microcrystalline wax and 0.5 to 3%, e.g. 0.5 to 1%, of petrolatum, and 0.1 to 3%, such as 0.2 to 2%, of higher ester, such as stearyl stearate. Instead of the microcrystalline wax and petrolatum there may be substituted 0.5 to 1.5% of polyethylene (MW = 1,000 to 4,000) and 0.5 to 2% of mineral oil (MW = 300 to 800). All such compositions may also include 2 to 5% of lauric monoethanolamide and 0.2 to 2% of hydroxyethyl cellulose.

Preferably the microcrystalline wax or petrolatum which is used includes in its formula a hydrocarbyl chain of at least 25 carbon atoms e.g. 25 to 50 preferably 25 or 27 to 39. Such materials help in the deposition of fiber conditioning compounds, such as quaternary ammonium compounds on fibers.

When poly-lower alkylene and/or oxidized poly lower alkylene are being used, of which polyethylene is a convenient example, a solubilizer, e.g. mineral oil may be used to render the polymer water dispersible or emulsifiable. The polymer which is normally solid preferably has a molecular weight in the range 1,000 to 5,000 e.g. 1,000 to 4,000 preferably 1,000 to 3,500 or 2,000 to 3,500. The mineral oil preferably has a molecular weight in the range 150 to 1,000 e.g. 300 to 800 or 400 to 700. The polymer typically has a solubility in water of less than 1 gram/100 ml e.g. less than 0.1 gram/100 ml.

For gels, pastes, thicker cremes and cake materials within the invention the required, optional and ajuvant components will normally be in the same ranges of proportions as in the aqueous compositions, with the proportion of water often being decreased, sometimes to as low as 30 or 40%. Also, the water may be replaced, up to 50% thereof in some special instances, but usually to no more than 20%, by another solvent, e.g., ethanol or isopropanol.

Although the hair conditioning compositions of this invention may be in the various physical forms mentioned, preferably they are in liquid form, such as a stable suspension, or lotion. Such compositions should be stable chemically and physically to be acceptable in the marketplace. They should not deteriorate to an unacceptable extent on storage, and should not have components settling out or phases separating during storage. The presence of the mentioned long chain primary alcohols (of the Unilin or Unithox type[s]) improves the stabilities of the invented compositions, in addition to giving them an

attractive pearlescent appearance and improving conditioning. Also, such shampoos will be of desirable viscosities, so as to be pourable, and yet will not be so thin that they run uncontrollably. The desired viscosity range is approximately 1,000 to 15,000 centipoises at room temperature (25° C.), preferably 3,000 to 6,000 centipoises. The invented shampoos are non-settling and non-separating, and do not chemically deteriorate on storage, as has been established by accelerated aging tests at elevated temperatures. The stability of the described shampoos is also promoted by incorporation in the shampoo formula of the long chain alcohol or "derivative" component, but can also be improved by the presence of other stabilizers, such as those of the acyl type. The shampoo viscosity may change slightly on storage but that change can be planned for and the formula and manufacturing process can be designed to control viscosity accordingly.

The improved hair conditioning obtained by use of the invented compositions, compared to controls, from which the mentioned conditioning agents and C_{6-10} alkyl-containing anionic detergents have been omitted, is noticeable to users of the shampoos and is measurable in standard tests that are used to evaluate conditioning and its components, including ease of wet combing, ease of dry combing, manageability, static charge retention and flyaway. The shampooer will note that the hair is easier to comb after shampooing, in both wet and dry states, compared to control hair washed with a shampoo that is not within the invention (with C_{6-10} alkyl compound anionic detergent missing from it). Scientific tests also prove that the force needed to move a comb through a standard hair tress after treatment (shampooing) of the hair with an invented shampoo, and rinsing, is measurably less than that when the hair tress is shampooed with a control shampoo. Such results are confirmed by panel tests, in which several experienced evaluators, using both the experimental and control products in blind tests, evaluate them for such combing ease, manageability and static characteristics and effects on the shampooed hair.

Uses of the invented compositions, including the shampoo, are not required to be different from normal uses of hair conditioning shampoos and other hair conditioning compositions. Conditioning compositions may be applied at room temperature or at somewhat elevated temperature in normal quantities and may be left on the hair for different lengths of time, depending on the extent of conditioning desired. Usually the conditioning agent and the hair will be at a temperature in the range of 15 to 50° C., preferably 20 to 40° C., and the conditioning composition will be in contact with the hair for from 30 seconds to ten minutes, preferably for one to five minutes. The amount of shampoo applied will normally be in the range of 0.5 to grams, often 2 to 15 or 20 grams and frequently five or ten grams per use. The shampoo is applied to the hair and is used to wash and condition it, after which it is rinsed off with water after remaining on the hair as an aqueous foam for a sufficient length of time, usually 1 to 5 minutes, so as satisfactorily to condition the hair. The hair is then wet combed, dried, as by blow drying, and dry combed or brushed to the desired style.

To manufacture the present shampoo no complex procedures have to be followed, but to obtain best stability, viscosity and appearance, and greatest conditioning activity, it will be desirable to form a dispersion of the water soluble anionic detergent(s) and adjuvants in water at an elevated temperature, such as 70 to 95°, melt together and/or dissolve lipophilic materials, such as quaternary ammonium salt, hydrocarbons, including polyethylene, mineral oil, microcrystalline wax, petrolatum, paraffin and isoparaffin, long chain alcohol and/or "derivative", C_{16-36} fatty acids and/or triglyceride,and higher fatty ester, e.g., stearyl stearate, to produce a melt or liquid mix at elevated temperature, and admix the two mixes at such elevated temperature, after which heated silicone and/or aminosilicone may be admixed with the resulting mix (it may sometimes also be included with the lipophiles), with the various mixings taking place with the parts to be mixed being at approximately the same temperatures. It is sometimes desirable for the silicone or aminosilicone to be mixed in after the main pre-mixing to promote better stability of the product. When adjuvants are present those which are water soluble and/or dispersible may be mixed in with the aqueous phase materials and those which are not water soluble or dispersible in the aqueous medium may be blended in with the lipophilic materials, such as the hydrocarbons, or in some instances may be added to the mixture of the hydrophilic and lipophilic materials either before or after cooling to room temperature. Normally perfume will be added to the other mixed components after cooling to room temperature but the silicone and/or aminosilicone will usually be added at elevated temperature and before such cooling. The perfume is added to the cooled composition to avoid losses thereof due to volatilizations of components and to prevent any degradation due to heating it. When the procedure described is not followed, as when the various components of the compositions are blended indiscriminately, less stable products can result, which can separate on storage.

The following examples illustrate but do not limit the invention. Unless otherwise indicated all parts are by weight and all temperatures are in degrees Centigrade in the examples, other parts of the specification, and in the claims.

EXAMPLES 1-5

Component	% (by weight)				
	1	2	3	4	5 (control)
Hydroxyethyl cellulose (Natrosol™ 250 HHR, Aqualon Corp.)	0.45	0.45	0.45	0.45	0.45
Hydroxyethyl cellulose (Natrosol™ 330 CS, Aqualon Corp.)	0.15	0.15	0.15	0.15	0.15
Ammonium lauryl sulfate	-	6.25	9.34	-	12.50
Sodium lauryl diethoxy ether sulfate	-	1.25	1.88	-	2.50
Sodium decyl triethoxy ether sulfate	15.00	7.50	3.75	-	-
Sodium decyl sulfate	-	-	-	15.00	-
Lauric monoethanolamide	3.50	3.50	3.50	3.50	3.50
Ethylene glycol distearate	0.75	0.75	0.75	0.75	0.75
Stearyl stearate	0.35	0.35	0.35	0.35	0.35
C_{18-36} triglyceride (Syncrowax™ HGL-C, Croda Corp.)	0.75	0.75	0.75	0.75	0.75
Tricetyl methyl ammonium chloride	0.50	0.50	0.50	0.50	0.50
Distearyl dimethyl ammonium chloride	0.25	0.25	0.25	0.25	0.25
Microcrystalline wax (M.P. = 82° C.)	1.00	1.00	1.00	1.00	1.00
Petrolatum, white (Alba Protopet)	1.50	1.50	1.50	1.50	1.50
Propylene glycol	0.50	0.50	0.50	0.50	0.50
Deionized water	75.30	75.30	75.33	75.30	75.30
	100.00	100.00	100.00	100.00	100.00

Compositions of Examples 1-5 are made by the method described in the specification, with mixings of the hydrophilic components, separate mixings of the lipophilic components and admixings thereof, all being conducted at elevated temperature, e.g., about 80° C., followed by admixings of any non-volatile silicone and/or aminosilicone component(s), when utilized, sodium chloride, to adjust viscosity, and sodium citrate or citric acid, to adjust pH, when such adjusting agents are utilized. Finally, the perfume will be admixed with the cooled unperfumed shampoo at about room temperature (25° C.), at which temperature the shampoo is pearlescent, especially when the long chain alcohol or "derivative" is present in the formula. Base shampoo formulas, without long chain alcohol or "derivative", silicone and/or aminosilicone, pH adjuster, viscosity modifier and perfume, are given herein. In formulas of subsequent examples such and other components of the shampoos will also be present.

The products made are attractive satisfactorily flowing liquid shampoos of viscosities that are less than 6,000 centipoises at 25° C. and their pH's are in the range of 5 to 7. All are sufficiently stable under ordinary storage conditions so as to be marketable, with no objectionable separation or settling out of components.When tested for hair conditioning capabilities, according to the tests described in the specification, they will be found to be good hair conditioning shampoos, with the compositions of Examples 1-4 being better than the control composition of Example 5, in such respect, which is attributed to the presence of the decyl sulfate and/or decyl ethoxy sulfate anionic detergent(s) in the formulas of Examples 1-4, instead of higher alkyl-containing detergents. The compositions of Examples 1 and 4 are better in hair conditioning than those of Examples 2 and 3, which is attributed to the presences of more of the decyl ethoxy sulfate (Example 1) and decyl sulfate (Example 4) than are in the other formulas.

The decyl-containing anionic detergents of the formulas of Examples 1-4 are of the broad range alkyl or conventional types, which are the normal detergents of commerce (for such products). However, when narrow range types are employed, wherein 80% or more of the alkyls, up to 100%, are within the range of 6 or 8 to 12 carbon atoms and 80% or more of the diethoxy and/or triethoxy groups are within the range of 1 ethoxy group to either side of that specified, for example, from 2 to 4 ethoxies for triethoxy, improved hair conditioning is obtainable and the shampoos tend to be thicker, which is a desirable characteristic. Also, it has been found that employment of a perfume identified as CP Paris K3-156 New Revised 3, also helps to increase the shampoo viscosity to a desirable extent.

In other variations of the formulas of these examples other anionic detergents may be substituted for the ammonium lauryl sulfate and sodium lauryl diethoxy sulfate, such as sodium C_{16} olefin sulfonate, sodium coco monoglyceride sulfate, sodium C_{14} paraffin sulfonate and sodium cetyl sulfate. Alternatively, ammonium, triethanolamine and potassium salts may be employed, and the results obtained will be essentially the same as those of the examples wherein ammonium lauryl sulfate and sodium lauryl diethoxy

sulfate are present instead. Similarly, the salt-forming cations may be changed for the decyl-containing detergents and the decyl group may be replaced by hexyl and/or octyl, or mixtures of all three.

EXAMPLES 6-9

Component	(% by weight)			
	6	7	8	9
Ammonium decyl sulfate	12.50	12.50	12.50	12.50
Sodium decyl diethoxy sulfate	2.50	2.50	2.50	2.50
Distearyl dimethyl ammonium chloride	0.50	0.50	0.50	0.50
Aminosilicone A (Dow-Corning)	1.50	1.50	1.50	-
Long chain ($C_{30\ average}$) alcohol	2.50	2.50	1.50	2.50
Long chain ($C_{40\ average}$) alcohol	-	-	1.00	-
Unithox 550 long chain ($C_{40\ average}$) alcohol ethoxylate (13 EtO)	-	-	1.00	-
Microcrystalline wax (M.P. = 82° C.)	1.00	-	-	-
Petrolatum, white	0.75	-	-	-
Syncrowax HGL-C (C_{18-36} triglyceride)	-	-	1.00	-
Polyethylene 617-A (Allied Corp.)	-	0.75	-	0.75
Paraffin wax (M.P. = 53° C.)	-	0.35	-	0.35
Mineral oil (Britol 50)	-	1.00	-	1.00
Isopar M (isoparaffin)	-	0.25	-	0.25
Lauric monoethanolamide	3.50	3.50	3.50	3.50
Hydroxyethyl cellulose 250 HHR	0.57	0.67	-	0.67
Hydroxyethyl cellulose 330 CS	0.18	0.23	-	0.23
Preservative	0.50	0.50	0.50	0.50
NaCl	0.20	0.20	0.20	0.20
Sodium citrate	-	-	0.25	-
Colorant	0.10	0.10	0.10	0.10
Perfume	0.80	0.80	0.80	0.80
Deionized Water	72.90	72.15	73.15	73.65
	100.00	100.00	100.00	100.00

The shampoo compositions of these examples are made by the method described with respect to Examples 1-4 and also in the specification, and it is found that all the shampoos made are attractive in appearance, of desirable viscosities and pH's and are stable at both normal and elevated temperature storage conditions so that separation on storage is avoided. More important, they are excellent hair conditioning shampoos and are better than control shampoos of identical formulas but with the ammonium decyl sulfate and sodium decyl diethoxy sulfate components being replaced by ammonium lauryl sulfate and sodium lauryl diethoxy sulfate, respectively. When the decyl-containing detergents are replaced by corresponding hexyl- and/or octyl-containing detergents the shampoos made also have the desirable properties of the decyl formulas.

The perfume employed is one identified by Colgate-Palmolive Company as their JCH-FLYA-007-C, New No. 3, revised, and such perfume or certain component(s) thereof has a noticeable and desirable effect on increasing the viscosity of the shampoo, whether or not any thickener, like the hydroxyethyl cellulose, is present. Thus, the perfume supplements the thickening action of the decyl-containing anionic detergent, and helps to bring the viscosity into the 3,000 to 6,000 centipoises range, at room temperature (25° C.). Such effects are also obtained when the perfume is included in the other formulas of these examples.

EXAMPLES 10-12			
	% (by weight)		
Component	10	11	12
Ammonium decyl sulfate	12.50	12.50	12.50
Sodium decyl ether sulfate (2 EtO per mole)	2.50	2.50	2.50
Distearyl dimethyl ammonium chloride	0.50	0.50	0.50
Aminosilicone A (Dow-Corning)	2.50	-	1.50
Long chain alcohol (Unilin™ 425, Petrolite Corp.)	2.50	2.50	2.50
Polyethylene (M.W. = 2,000, Allied Corp.)	-	0.75	0.75
Microcrystalline Wax (M.P. = 82° C.)	1.00	-	-
Paraffin wax (M.P. = 53° C., Boler Petroleum Corp.)	-	0.35	0.35
Isoparaffins (Isopar™ M, Exxon Corp.)	-	0.25	0.25
Petrolatum, white (Alba Protopet™)	0.75	-	-
Mineral oil (Britol™ 50, Boler Petroleum Corp.)	-	1.00	1.00
Hydroxyethyl cellulose 250 HHR (Aqualon Corp.)	0.57	0.67	0.67
Hydroxyethyl cellulose 330 CS (Aqualon Corp.)	0.18	0.23	0.23
Lauric monoethanolamide	3.50	3.50	3.50
Sodium chloride	0.20	0.20	0.20
Preservative (Germaben™ II)	0.50	0.50	0.50
Perfume	0.80	0.80	0.80
Colorant	0.10	0.10	0.10
Deionized water	71.90	73.85	72.15
	100.00	100.00	100.00

The shampoo compositions of these examples are also made by the procedure described in the preceding examples. Shampoos resulting are of satisfactory appearance, viscosity and pH, and are stable under usual and elevated temperature storage conditions. The shampoos made are better in conditioning effects, including manageability, dry combing and wet combing, compared to "control" formulas in which the ammonium decyl sulfate is replaced by ammonium lauryl sulfate and the sodium decyl ether sulfate (2 EtO per mole) is replaced by sodium lauryl ether sulfate (2 EtO per mole).

EXAMPLES 13-15			
	% (by weight)		
Component	13	14	15
Ammonium decyl sulfate	12.50	12.50	12.50
Sodium decyl diethoxy sulfate	2.50	2.50	2.50
Distearyl dimethyl ammonium chloride	0.50	0.50	0.50
Aminosilicone A (Dow-Corning)	1.50	-	1.50
Long chain linear alcohol (Unilin 425, Petrolite Corp.)	1.50	1.50	1.50
Long chain linear alcohol (Unilin 550, Petrolite Corp.)	1.00	1.00	1.00
Long chain linear alcohol ethoxylate (Unithox™ 550, Petrolite Corp.)	1.00	1.00	1.00
C_{18-36} triglyceride (Syncrowax HGL-C, Croda Corp.)	1.00	1.00	1.00
Paraffin wax (M.P. = 53° C., Boler Petroleum Corp.)	-	0.35	0.35
Polyethylene 617-A (Allied Corp.)	-	0.75	0.75
Mineral oil (Britol 50, Boler Petroleum Corp.)	-	1.00	1.00
Isoparaffin (Isopar M, Exxon Corp.)	-	0.25	0.25
Lauric monoethanolamide	3.50	3.50	3.50
Preservative (Germaben II)	0.50	0.50	0.50
Sodium citrate	0.25	0.25	0.25
Perfume	0.80	0.80	0.80
Colorant	0.10	0.10	0.10
Deionized water	73.35	72.50	71.00
	100.00	100.00	100.00

The shampoos of these examples are made in the manner previously indicated and are tested by similar practical and instrumental testing techniques. As a result of such testing it is found that the shampoos made are stable and very effective hair conditioning shampoos which do not separate at elevated temperature storage test conditions, and which condition the hair better than "control" shampoos wherein the ammonium decyl sulfate is replaced by ammonium lauryl sulfate and the sodium decyl diethoxy sulfate is replaced by sodium lauryl diethoxy sulfate.

EXAMPLES 16-18			
Component	%(by weight)		
	16	17	18
Filtered irradiated deionized water	69.68	69.28	71.64
Hydroxyethyl cellulose (Natrosol 250 HHR)	-	0.20	-
Ammonium lauryl sulfate	7.50	7.50	11.25
Sodium lauryl diethoxy ether sulfate	2.50	2.50	-
Sodium decyl triethoxy ether sulfate	5.00	5.00	3.75
Lauric monoethanolamide	3.50	3.50	-
Monobasic ammonium phosphate (buffer)	-	-	0.10
Microcrystalline wax (MultiwaxTM180-M, Witco Chemical Corporation)	1.00	1.00	-
Petrolatum, snow white, Alba Protopet, Witco Chemical Corporation)	2.00	2.00	-
Distearyl dimethyl ammonium chloride	0.50	0.50	-
Unilin 425 ($C_{30(average)}$ linear alcohol, Petrolite Corp.)	2.40	2.50	-
Unilin 550 ($C_{40(average)}$ linear alcohol Petrolite Corp.)	2.40	2.50	-
Cocodiethanolamide (Standamid KD)	-	-	5.00
Aminosilicone A (Dow Corning)	1.50	1.50	3.00
Perfume (CP Paris K3-156 new revised 3)	0.80	0.80	0.80
Preservative (Germaben II)	0.50	0.50	0.50
Dye mix (0.44% aqueous solution)	0.71	0.71	0.71
Citric acid, anhydrous	0.01	0.01	-
Sodium chloride	-	-	0.25
	100.00	100.00	100.00

Shampoos of the above formulas are made in the manner previously described, with the materials in the first group being mixed together in the aqueous medium, the materials of the second group being melted together and admixed with the aqueous mix, the aminosilicone being admixed with such mixture, and the last group of adjuvants being admixed with the previous admixture after cooling thereof to room temperature. Products resulting are all attractive looking pearlescent lotion shampoos of desirable pH and viscosity in the ranges previously given and they condition hair shampooed with them as well as or better than the leading commercial hair conditioning shampoos. The products are stable on storage, as shown by elevated temperature storage tests.

When pure C_{30} and C_{36} long chain linear alcohols are substituted for the broader range distribution long chain alcohols of the examples similar results are obtainable, with the shampoos of such formulas being pearlescent, lotion-like in appearance, of desirable viscosity and of excellent hair conditioning properties. Similarly, when other non-volatile silicones and dimethicones are employed in replacement of the Aminosilicone A, acceptable products result, although the conditioning is usually not as good as that obtained when similar proportions of Aminosilicone A are employed. Also, when instead of the decyl sulfate and decyl ethoxy sulfate there are substituted the corresponding hexyl and octyl compounds improved conditioning, of essentially the same type as that with the decyl compounds, is obtainable.

EXAMPLE 19	
Component	% (by weight)
Deionized water	72.00
Ammonium lauryl sulfate	12.50
Sodium hexyl sulfate	2.50
Monobasic ammonium phosphate	0.20
Unilin 425	3.00
Cocodiethanolamide	5.00
Aminosilicone A	3.00
Perfume	0.80
Preservative	0.50
Sodium chloride	0.50
	100.00

EXAMPLES 20-23				
Component	% (by weight)			
	20	21	22	23
Deionized water	72.00	75.10	75.10	75.10
Natrosol 250 HHR	-	0.45	0.45	0.45
Natrosol 330 CS	-	0.15	0.15	0.15
Ammonium lauryl sulfate	9.00	12.12	11.87	11.25
Sodium octyl diethoxy ether sulfate	6.00	0.45	0.75	1.50
Sodium lauryl diethoxy ether sulfate	-	2.43	2.38	2.25
Monobasic ammonium phosphate	0.20	-	-	-
Unilin 425	3.00	-	-	-
Cocodiethanolamide	5.00	-	-	-
Lauric monoethanolamide	-	3.50	3.50	3.50
Ethylene glycol distearate	-	0.75	0.75	0.75
Stearyl stearate	-	0.35	0.35	0.35
Syncrowax HGL-C	-	0.75	0.75	0.75
Tricetyl methyl ammonium chloride	-	0.50	0.50	0.50
Distearyl dimethyl ammonium chloride	-	0.25	0.25	0.25
Microcrystalline wax	-	1.00	1.00	1.00
Petrolatum	-	1.50	1.50	1.50
Aminosilicone A	3.00	-	-	-
Propylene glycol	-	0.50	0.50	0.50
Perfume	0.80	-	-	-
Germaben II (preservative)	0.50	0.20	0.20	0.20
Sodium chloride	0.50	-	-	-
	100.00	100.00	100.00	100.00

The compositions of Examples 20-23 are made in the manner previously described and are all satisfactory conditioning shampoos, with conditioning properties equal to or better than leading commercial conditioning shampoos. In the composition of Example 20 the aminosilicone is the principal hair conditioning agent, with the long chain higher alcohol contributing to such conditioning while at the same time stabilizing the shampoo and making it pearlescent. In Examples 21-23 the aminosilicone and long chain alcohol are omitted and conditioning is effected by a combination of conditioning agents. In Examples 20-23 sodium octyl diethoxy ether sulfate is employed in conjunction with ammonium lauryl sulfate as the detergent, and the octyl-containing detergent helps to increase the conditioning actions of the conditioning components of the shampoo.

EXAMPLE 24

In the preceding examples, wherein the preferred ammonium decyl sulfate and sodium decyl ethoxy sulfate mixtures are employed in conjunction with the described water insoluble conditioning agent(s) and cationic surfactant, it has been possible to make improved hair conditioning compositions, such as shampoos, which are as good as or better in conditioning properties than other such compositions now being marketed. Similar results are obtainable when other decyl-containing and/or corresponding hexyl- and octyl-containing sulfates and ethoxy sulfates are substituted for the decyl compounds of the examples, as their sodium, ammonium and triethanolamine salts. Also, for examples, the sodium decyl diethoxy sulfate can be replaced by ethoxy sulfates wherein the ethoxy group is of 1 or 3 to 6 carbon atoms, preferably 3, the sodium is replaced by ammonium or triethanolamine, and the decyl is replaced by hexyl or octyl. In like manner the distearyl dimethyl ammonium chloride, if present, may be replaced by other quaternary ammonium salts, such as tricetyl methyl ammonium bromide or chloride, dilauryl dimethyl ammonium chloride, and sometimes even by trimethyl stearyl ammonium chloride or the corresponding tallowyl compounds (in which the alkyl is that obtained from beef tallow). Variations in the mentioned water insoluble hair conditioning agents may be made, utilizing other embodiments of such materials within the description given in the specification, including other long chain primary alcohols and ethoxylated such alcohols of an average of 24 to 45, preferably 30 to 40, carbon atoms in the alcohol chain, and corresponding esters and acids, and the aminosilicone may be changed to be of different substituents and molecular weights within the formula given, and sometimes even non-volatile, dispersible silicones and dimethicones (which do not contain any amino groups) may be employed, such as those disclosed and illustrated in U.S. patent 4,704,272. Various of the mentioned water insoluble conditioning agents may be substituted and/or added, and various adjuvants may be substituted for and/or added to those in the given formulas. For example, the lauric monoethanolamide or cocodiethanolamide may be replaced by lauric myristic mono- or diethanolamides or isopropanolamides or by corresponding lauryl and coco amides. EDTA may be included, and the hydroxylated ethyl celluloses may be replaced by hydroxypropylmethyl celluloses, methyl cellulose or natural gums, e.g., guar gum.

The aminosilicones may be replaced by non-amino silicones and dimethicones too, such as the compounds of U.S. patent 4,704,272, and the cationic conditioners may be replaced by other suitable disclosed substitutes or equivalents. The compositions made of various such different formulas will also be high quality, satisfactorily conditioning, stable and attractively pearlescent shampoos of desired pH and viscosity.

The proportions of the various components of the described compositions of this example and of Examples 1-4 and 6-23 may be varied ±10%, ±20% and ±30%, while still remaining within the ranges mentioned in the specification, and hair conditioning shampoos of improved hair conditioning properties will result. Also, when the "conventional"longer chain alkyl-containing anionic detergent(s) of the shampoos described herein, especially of the working examples, are modified so as to include hexyl-, octyl- and/or decyl-containing detergents in replacement of some of the higher alkyl-containing anionic detergents, better hair conditioning effects are obtained.

When the present shampoos or the variations of the invention that have been described are used as conditioning hair shampoos, according to methods described herein, which include application thereof to the hair, in the presence of additional water, followed by rinsing, the hair is satisfactorily cleaned and conditioned. It may be combed more readily when wet or dry, does not accumulate objectionable static charges to the extent found with control shampoos and will be more manageable and softer to the touch than hair shampooed with such controls.

The present invention is in large part an improvement over the invention described in US patent application No. 507335 of Patel and Robbins, entitled Hair Conditioning Shampoo Containing Long Chain Alcohol Component, which was filed on 9 April 1989 and corresponds to EP Application No. Serial No. . Therefore, the various shampoos described therein can also be improved further in hair conditioning properties by replacing a part of any C_{12} and higher lipophile-containing detergent with the corresponding or other hexyl-, octyl- and/or decyl-containing detergent compounds.

The various patents, patent applications and publications previously referred to in this specification are hereby incorporated herein by reference.

This application is a continuation-in-part of previous patent applications USSN's : 07/369,361; 07/369,389; 07/432,644; and 07/432,952. S.N's 07/432,644 and 07/432,952 are each continuations-in-part of S.N. 07/369,361.

Other useful formulations are given below.

EXAMPLE 25			
	% (by weight)		
Component	25A	25B	25C
Ammonium lauryl sulfate	12.50	12.50	12.50
Sodium lauryl ether sulfate (2 EtO per mole)	2.50	2.50	2.50
Distearyl dimethyl ammonium chloride	0.50	0.50	0.50
Aminosilicone A (Dow-Corning)	2.50	-	1.50
Long chain alcohol (Unilin™ 425, Petrolite Corp.)	2.50	2.50	2.50
Polyethylene (M.W. = 2,000, Allied Corp.)	-	0.75	0.75
Microcrystalline Wax (M.P. = 82° C.)	1.00	-	-
Paraffin wax (M.P. = 53° C., Boler Petroleum Corp.)	-	0.35	0.35
Isoparaffins (Isopar™ M, Exxon Corp.)	-	0.25	0.25
Petrolatum, white (Alba Protopet™)	0.75	-	-
Mineral oil (Britol™ 50, Boler Petroleum Corp.)	-	1.00	1.00
Hydroxyethyl cellulose 250 HHR (Aqualon Corp.)	0.57	0.67	0.67
Hydroxyethyl cellulose 330 CS (Aqualon Corp.)	0.18	0.23	0.23
Lauric monoethanolamide	3.50	3.50	3.50
Sodium chloride	0.20	0.20	0.20
Preservative (Germaben™ II)	0.50	0.50	0.50
Perfume	0.80	0.80	0.80
Colorant	0.10	0.10	0.10
Deionized water	71.90	73.65	72.15
	100.00	100.00	100.00

Compositions of Formulas 25A, 25B and 25C are made by the method described in the specification, with mixings of the hydrophilic components, separate mixings of the lipophilic components and admixings thereof, all conducted at elevated temperature, e.g., 80° C., followed by admixings of the aminosilicone components, when present, and sodium chloride, to adjust the viscosity, and final addition of perfume after cooling of the unperfumed shampoo to about room temperature (25° C.), which is when pearlescence occurs.

The products made are all attractively pearlescent liquid shampoos of viscosities in the range of 3,000 to 8,000 centipoises at 25° C. and of pH's in the range of 6 to 7, and are all found to be stable by elevated temperature storage tests, with no appreciable separation or settling out of components. When tested for hair conditioning capabilities, according to the tests described in the specification, they are found to be good conditioning shampoos, all being better than controls that do not contain the water insoluble conditioning agents present in the given formulas. The conditioning obtained from each of the described formulas is at least equivalent to the best of all the commercial conditioning shampoos presently on the market and the shampoo of Formula 25C is even measurably and significantly better in conditioning action than such commercial product.

When the anionic detergent component is removed from the 25C formula the hair conditioning (and fiber conditioning) composition resulting is useful for the treatment of fibrous materials and may be employed as a rinse for human hair. In both such applications, even after rinsing off the product with water the fibrous material treated will be of lower static charge, will be soft and pliant to the touch, and will be glossy and attractive in appearance. Also, when human hair is so treated it will be less subject to objectionable "flyaway" and will be more readily combable and manageable.

In other modifications of Formulas 25A, 25B and 25C, which are also outside this invention, like the modification of Formula 25C mentioned above, when the long chain alcohol is omitted from the formulas and is replaced by deionized water the shampoo tends to become unstable and to separate into different phases and/or have components thereof settle out on elevated temperature storage. Also, hair conditioning is not as good and pearlescence is either non-occurring or is diminished and less attractive.

When Aminosilicone A is replaced by conventional non-volatile silicones or other aminosilicones in Formulas 25A and 25C conditioning activity is noticeably diminished (but is still present). Such activity for Formula 25C may be increased further by adding 1% of Aminosilicone A to the formula in replacement of 1% of the deionized water, so as to increase the percentage of Aminosilicone A to 2.50%, equal to that of Formula 25A. Similarly, when 2.50% of Aminosilicone A is added to the formula of Example 25B in place of

a like percentage of water, conditioning is also substantially improved.

EXAMPLE 26

Component	% (by weight)		
	26A	26B	26C
Ammonium lauryl sulfate	12.50	12.50	12.50
Sodium lauryl diethoxy sulfate	2.50	2.50	2.50
Distearyl dimethyl ammonium chloride	0.50	0.50	0.50
Aminosilicone A (Dow-Corning)	1.50	-	1.50
Long chain linear alcohol (Unilin 425, Petrolite Corp.)	1.50	1.50	1.50
Long chain linear alcohol (Unilin 550, Petrolite Corp.)	1.00	1.00	1.00
Long chain linear alcohol ethoxylate (Unithox™ 550, Petrolite Corp.)	1.00	1.00	1.00
C_{18-36} triglyceride (Syncrowax HGL-C, Croda Corp.)	1.00	1.00	1.00
Paraffin wax (M.P. = 53° C., Boler Petroleum Corp.)	-	0.35	0.35
Polyethylene 617-A (Allied Corp.)	-	0.75	0.75
Mineral oil (Britol 50, Boler Petroleum Corp.)	-	1.00	1.00
Isoparaffin (Isopar M, Exxon Corp.)	-	0.25	0.25
Lauric monoethanolamide	3.50	3.50	3.50
Preservative (Germaben II)	0.50	0.50	0.50
Sodium citrate	0.25	0.25	0.25
Perfume	0.80	0.80	0.80
Colorant	0.10	0.10	0.10
Deionized water	73.35	72.50	71.00
	100.00	100.00	100.00

The shampoo compositions of this example are made by the method described in Example 25 and elsewhere in the specification, and it is found that all the shampoos made are attractively pearlescent and are stable under elevated temperature storage conditions. Additionally, they are excellent hair conditioning shampoos, equalling or exceeding shampooing and hair conditioning properties of the best commercial hair conditioning shampoo on the market, with Formulas 26A and 26B equalling such conditioning power and Formula 26C surpassing it. The three shampoos made are of desired viscosity and pH, like those of the compositions of Example 25.

EXAMPLE 27		
	%(by weight)	
Component	27A	27B
Ammonium lauryl sulfate	12.50	12.50
Sodium lauryl ethoxylate sulfate (2 EtO)	2.50	2.50
Distearyl dimethyl ammonium chloride	0.50	0.50
Aminosilicone A (Dow-Corning)	1.50	1.50
Long chain alcohol (Unilin 425)	1.00	1.00
Microcrystalline wax	1.00	-
Petrolatum, white	0.75	-
Syncrowax HGL-C (Croda Corp.)	0.75	0.75
Polyethylene 617-A (Allied Corporation)	-	0.75
Mineral oil (Britol-50)	-	1.00
Lauric monoethanolamide	3.50	3.50
Hydroxyethyl cellulose	0.75	0.75
Preservative (Germaben II)	0.50	0.50
Colorant	0.10	0.10
Perfume	0.80	0.80
Deionized water	73.85	73.85
	100.00	100.00

Shampoo compositions Of this example are made in the same manner as described in Examples 25 and 26, and in the preceding specification (and also in U.S. patent application S.N. 07/432,952 corresponding to EP Application no. Serial no.). The two shampoos made both utilize long chain saturated primary alcohol of the Unilin 425 type in conjunction with $C_{18-36\ (mixed)}$ triglyceride, aminosilicone and polyethylene or with aminosilicone, microcrystalline wax and petrolatum, as water insoluble conditioning agents. The shampoos made are attractively pearlescent and are stable on elevated temperature storage. Additionally, they are of improved hair conditioning properties, with the 27B formula being even better in hair conditioning than the 27A formula. When the amounts of the Aminosilicone A and Unilin 425 are increased, to 2.50% and 2.00%, at the expense of the deionized water, conditionings are improved even further, and stabilities and pearlescences are still excellent.

EXAMPLE 28

Component	% (by weight) 28A	28B	28C	28D
Ammonium lauryl sulfate	12.50	12.50	12.50	12.50
Sodium lauryl diethoxy sulfate	2.50	2.50	2.50	2.50
Distearyl dimethyl ammonium chloride	0.50	0.50	0.50	0.50
Aminosilicone A (Dow-Corning)	1.50	1.50	1.50	-
Long chain ($C_{30\ average}$) alcohol	2.50	2.50	1.50	2.50
Long chain ($C_{40\ average}$) alcohol	-	-	1.00	-
Unithox 550 long chain ($C_{40\ average}$) alcohol ethoxylate (13 EtO)	-	-	1.00	-
Microcrystalline wax	1.00	-	-	-
Petrolatum, white	0.75	-	-	-
Syncrowax HGL-C	-	-	1.00	-
Polyethylene 617-A (Allied Corp.)	-	0.75	-	0.75
Paraffin wax (M.P. = 53° C.)	-	0.35	-	0.35
Mineral oil (Britol 50)	-	1.00	-	1.00
Isopar M	-	0.25	-	0.25
Lauric monoethanolamide	3.50	3.50	3.50	3.50
Hydroxyethyl cellulose 250 HHR	0.57	0.67	-	0.67
Hydroxyethyl cellulose 330 CS	0.18	0.23	-	0.23
Preservative	0.50	0.50	0.50	0.50
NaCl	0.20	0.20	0.20	0.20
Sodium citrate	-	-	0.25	-
Colorant	0.10	0.10	0.10	0.10
Perfume	0.80	0.80	0.80	0.80
Deionized Water	72.90	72.15	73.15	73.65
	100.00	100.00	100.00	100.00

The compositions of this example are made in the same manner as described in Examples 25-27 and in U.S. patent application S.N. 07/432,952. The products resulting, all of which contain a long chain alcohol or derivative of type(s) described herein which improve(s) conditioning and stability and make(s) the shampoo pearlescent, are all attractive pearlescent liquids of pH's the range of 6 to 7 and viscosities in the range of 3,000 to 6,000 centipoises at 25° C. All are of improved stability, compared to compositions which do not contain the long chain alcohol or derivative thereof, and all are excellent cleaning agents and conditioners for hair. It will be noted that all the compositions contain the preferred long chain $C_{30\ average}$ alcohol, with Formula 28C also including the corresponding $C_{40\ average}$ alcohol and an ethoxylated such alcohol.

Formula 25C also contains no gums and relies for conditioning primarily on Aminosilicone A, the long chain alcohols, the "derivative" thereof, and long chain fatty acid triglyceride (Syncrowax). Best conditioning and stabilizing effects are obtained with Formula 28C but all of the four compositions are excellent conditioning shampoos, competitive in desirable conditioning properties, stability and appearance with the best commercial conditioning shampoos that are on the market.

EXAMPLE 29

In preceding Examples 25-28 the preferred ammonium lauryl sulfate and sodium lauryl ethoxy sulfate mixtures were employed but similar results are obtainable when other higher alkyl sulfates, such as the sodium and triethanolamine salts of C_{14-18} alkyl sulfuric acids, are employed. Similarly, the sodium lauryl ethoxy sulfate can be replaced by sodium C_{14-15} ethoxy sulfates wherein the ethoxy group is of 1 or 2 to 5 or 6 carbon atoms, preferably 3, and the sodium is replaced by ammonium or triethanolamine. In like manner the distearyl dimethyl ammonium chloride may be replaced by other quaternary ammonium salts, such as tricetyl methyl ammonium bromide or chloride, dilauryl diethyl ammonium chloride and sometimes even by trimethyl stearyl ammonium chloride or the corresponding tallowyl compound (in which the alkyl is

that obtained from beef tallow). Variations in the other water insoluble hair conditioning agents may be made, utilizing other embodiments of such materials within the description given in the specification, including other ethoxylated long chain primary alcohols of an average of 24 to 40 carbon atoms in the alcohol chain, and corresponding esters and acids. Various adjuvants may be substituted for those in the given formulas. For example, the monoethanolamide may be replaced by lauric myristic mono- or diethanolamide or the corresponding coco alkanolamide, or by corresponding isopropanolamides, EDTA may be included, and the hydroxylated ethyl celluloses may be replaced by hydroxylated propylmethyl celluloses, methyl cellulose or other suitable gums or thickeners. In such cases the compositions made will be of high quality and will be satisfactorily conditioning, stable and attractively pearlescent shampoos of desired pH and viscosity. Similarly, when the anionic detergent(s) is/are omitted from the formula conditioning rinses and fiber conditioners are obtainable which will be of similar properties and which satisfactorily condition fibrous materials, such as hair, in the manner described. Such compositions may be in liquid, gel, paste or creme form.

EXAMPLE 30		
	% (by weight)	
Component	30 A	30 B
Part I		
Irradiated deionized water	72.19	71.89
Hydroxyethyl cellulose (Natrosol 250 HHR)	0.20	-
Ammonium lauryl sulfate	15.00	15.00
Monobasic ammonium phosphate (buffer)	0.10	0.10
Part II		
Unilin 425	3.00	3.00
Cocodiethanolamide	4.00	5.00
Part III		
Aminosilicone A	3.00	3.00
Part IV		
Perfume (CP Paris K3-157 new revised 3)	0.80	0.80
Sodium chloride	0.50	-
	100.00	100.00

In essentially the same manner previously described, the components of each of Parts I and II were separately mixed and were then admixed at 90° C., followed by sequential additions thereto of Parts III and IV, with the addition of Part IV being at room temperature. The shampoos made are both pearlescent and attractive in appearance, and are of desired viscosity and pH. Both condition hair washed with them as well as or better than the most effective of the leading hair conditioning shampoos on the U.S. market at present.

In the formula given the quantity of Aminosilicone A is on the basis of pure aminosilicone, although it was employed together with one part of a solvent for the silicone per three parts of silicone, so as to reduce its viscosity (and such was also employed in the other Examples, in which the quantities are also on the basis of the pure aminosilicone. Also, the ammonium phosphate buffer may be employed in a proportion up to 0.20% in these formulas.

In a variation of the formula, instead of employing Unilin 425, Unilin 550 or pure long chain linear saturated alcohols of 30 or 36 carbon atoms to the molecule (or a mixture thereof) may be substituted and the results are equivalent. However, further improvements in conditionings may be obtained by incorporation in the formulas of quaternary ammonium salt, e.g., distearyl dimethyl ammonium chloride, and other conditioning agents, e.g., microcrystalline wax, petrolatum, polyethylene and beeswax. Also, the aminosilicone may be replaced by non-amino silicones and dimethicones, such as the silicones of U.S. patent No. 4,704,272, and other non-volatile (preferred) water insoluble silicones.

EXAMPLE 31

The compositions of the preceding examples may be further modified, by changing the proportions of the various components thereof ±10%, ±20% and ±30%, while maintaining them within the ranges recited elsewhere in the specification, and the modified compositions resulting will be stable, pearlescent shampoos and fiber conditioning products of improved hair conditioning and fiber conditioning properties. When such are employed to shampoo the hair or are used as conditioning hair rinses, according to the processes described in this specification, which include application to the fibrous material or hair, often in the presence of additional water, followed by rinsing, the hair is satisfactorily cleaned and conditioned. It may be combed more readily when wet or dry, will not accumulate objectionable static charges and will be manageable and softer to the touch.

The compositions of this invention, as represented by the formulas and descriptions given in the preceding examples, are significant advances in the fiber conditioning and hair conditioning arts. By utilizing the described long chain primary alcohol, which is preferably completely saturated, or its "derivative(s)", in conjunction with the described water insoluble conditioning agent(s) (and cationic surfactant), it has been possible to make greatly improved hair conditioning compositions, such as shampoos, which are as good as or better in conditioning properties than any such compositions previously marketed. Such has been accomplished by utilizing the mentioned long chain alcohols or their derivatives, such as the Unilins and Unithoxes, whihc are available materials but which were heretofore not known as components of hair conditioning compositions or shampoos.

EXAMPLES 32A and 32B

Component	Percent (by weight) 32A (invention	32B (control)
* Natrosol™ 250HR	0.45	0.45
** Natrosol 330PA	0.15	0.15
Ammonium lauryl sulfate	12.50	12.50
*** Sodium lauryl ether sulfate	2.50	2.50
Lauric monoethanolamide	3.50	3.50
Ethylene glycol distearate	0.75	0.75
Stearyl stearate	0.35	0.35
Propylene glycol, U.S.P.	0.50	0.50
**** Syncrowax™ HGC-L	0.75	0.75
+ Britol™/50	4.00	-
++ AC Polyethylene 9A (drop point of 117°C., M.W. in range of 2,000 - 4,000)	0.4	-
+++ Tricetyl methyl ammonium chloride	0.50	0.50
++++ Germaben™ II	0.50	0.50
Colorant (dye and/or water dispersible pigment)	0.10	0.10
Sodium chloride	0.10	0.10
Citric acid	0.01	0.01
Water, deionized and irradiated	72.44	76.84
Perfume	0.50	0.50
	100.00	100.00

* Hydroxyethyl cellulose (Hercules Corp.)

** Hydroxyethyl cellulose (Hercules Corp.)

*** Ether group = diethoxy

**** C_{18-36} acid triglyceride (Croda Corp.)

\+ Mineral oil, of m.w. in the range of 400 to 800 (Witco/Penreco Corp.)

\++ Polyethylene homopolymers, of M.W. in the range of 2,000 to 4,000, drop point of 117°C. (Allied Signal, Inc.)

\+++ Trade name is PC-90 (Sherex Chemical Corp.)

\++++ Preservative (Sutton Laboratories, Inc.)

The conditioning composition of the A formula given above is made by heating together the water soluble and water dispersible materials of the formula, with all or substantially all of the water of the formula (if less than all the water is used at this stage the rest is added to the mix of heated aqueous portion and of the heated lipophilic melt or dispersion). The polyethylene, mineral oil, paraffin wax and any other "liquid" hydrocarbons are heated together to a temperature of about 80°C. The heated pre-mixes are mixed together, with stirring, for ten minutes. This produces a stable shampoo that does not separate or settle out after storage for a month at elevated temperature, which is equivalent to storage for at least a year at room temperature. The shampoo so-made is tested for conditioning properties by a panel of at least five experienced evaluators of such products,for conditioning effects, and the panel members test hair tresses and/or hair on the head that is shampooed with such composition, rinsed with water and dried, evaluating the hair with respect to various conditioning characteristics, including ease of wet combing, ease of dry combing, static charge, flyaway and manageability.

In a similar manner a control shampoo (B) is made, which is of the same formula as the A shampoo except for the omission of the polyethylene and the mineral oil, which are replaced by water. Both compositions are of pH's of approximately 6.5 and of viscosities, at 25°C., of about 3,500 or 4,000 centipoises. Hair tresses shampooed with such control composition followed by rinsing and drying, in the same manner as practiced with respect to the A composition, are evaluated by the panel members and the evaluations are compared to those for the hair shampooed by the A composition, as described, followed by rinsing and drying it. The panel members find that overall conditioning effects from using the A composition are significantly better than those for the B composition. With evaluations numerically on a scale of 1 to 5, with the higher the number the better the conditioning, the ratings are about 2 for the B treatment and about 5 for the A treatment.

EXAMPLE 33

Component	Percent (by weight)
Ammonium lauryl sulfate	12.50
* Sodium lauryl ether sulfate	2.50
Coco diethanolamide	3.50
Natrosol 250HR	0.45
Natrosol 330PA	0.15
Ethylene glycol distearate	0.75
Stearyl stearate	0.35
Propylene glycol, U.S.P.	0.50
Syncrowax HGC-L	0.75
** Paraffin wax (m.p. = 36°C.)	0.35
Britol/50	1.00
*** AC Polyethylene 617A	0.75
**** Isopar™ M	0.25
Tricetyl methyl ammonium chloride	0.50
Germaben II	0.50
Sodium chloride, crystalline	0.10
Citric acid (or sodium citrate, when pH is too acidic)	0.01
Water, deionized and irradiated	74.34
Perfume	0.75
	100.00

* Sodium lauryl diethoxy or triethoxy ether sulfate

** C_{20-40} straight chain paraffins

*** Polyethylene homopolymer, of M.W. in the range of 2,000 to 4,000

**** C_{13-14} isoparaffins

A shampoo of the above formula is made in the same manner as described for manufacture of the shampoo of Example 32, and the melt of lipophilic materials includes polyethylene, mineral oil, paraffin wax and isoparaffin. The resulting shampoo is of a pH of about 6.5 and a viscosity of about 3,500 or 4,000 centipoises at 25° C., and is stable on storage, maintaining its initial improved hair conditioning properties and not settling out, separating or otherwise deteriorating on storage for up to a year.

When tested against a control shampoo of the same formula except for the omission of the polyethyl-

ene it is measurably better in hair conditioning properties, which evaluation is based on a totality of wet combing ease, dry combing ease, greater manageability, less static and less flyaway for hair tresses shampooed with the invented formula, compared to tresses shampooed with the control.

In the above formula the anionic detergents are changed, proportions thereof are modified, supplemental hair conditioning agents are added, and it is confirmed that the presence of the polyethylene, as solubilized by the mineral oil, desirably improves the conditioning characteristics of the hair conditioning shampoo. The invented products of Examples 32 and 33 are considered to be significant improvements over prior art conditioning shampoos of such types primarily because of the presence therein of the polylower alkylene conditioning agent in conjunction with the mineral oil and the cationic conditioning surfactant. The differences in conditioning are not merely noticeable by instrumental testing or by trained observers but are apparent to the average consumer, the user of such products. The shampooed hair is noticeably easier to comb out in wet condition and to brush and comb in dry condition. It is easier to set and is more manageable, at least in part because of a lower static charge being generated thereon and because there is less tendency for the hairs to repel each other, which repellent actions cause objectionable flyaway.

The compositions described in Examples 32 and 33 are hair conditioning shampoos but the invention is also applicable to the formulating of fiber conditioners and to non-shampoo hair conditioning compositions. Thus, such products may be applied to other natural fibers, such as cotton, linen and wool, and to synthetics, such as nylons, polyesters, acrylics, and acetates,to condition them. Also, when the required cationic conditioners, polyethylene and mineral oils of the Examples 32 and 33 compositions are employed in solutions in alcoholic or other suitable solvents or are converted to gel or other suitable form and are applied to the hair, as by spraying thereon, applying as a liquid and brushing in, or applying as a gel and rubbing into the hair, the hair is noticeably conditioned by such applications. When such applications are made from aqueous systems better conditionings are obtained than when the mineral oil and any other solubilizing hydrocarbons are omitted from the compositions (in which case the shampoos cannot be made in usable condition because the polyethylene will not be satisfactorily dispersed or emulsified).

EXAMPLE 34

When, in variations of the formulations of Examples 32 and 33, the various adjuvants are omitted from the formulas so that the shampoos made contain only the required constituents thereof, the anionic surfactant, cationic surfactant conditioner, polyethylene, solubilizing liquid hydrocarbon (mineral oil) and water, the shampoos made are less viscous than is desirable but are usefully employable to shampoo and condition hair. When the mineral oil is omitted from the formulas the polyethylene cannot be dispersed or emulsified in the system. When, instead of the described mineral oil, other lighter and heavier mineral oils and other normally liquid hydrocarbons are employed to solubilize the polyethylene, improvements in conditioning over uses of similar compositions that do not contain such solubilizing agents are obtainable but sometimes such other hydrocarbons can be cosmetically unacceptable or toxic. Mineral oil is considered to be innocuous, it helps to impart a luster to the shampooed hair and often it functions as a better solubilizer for the polyethylene, all of which makes it a more highly preferred solubilizing agent in the invented compositions.

When the compositions of the invention are modified by changing any of the various required components of the invented conditioning compositions and shampoos of the Examples to others of the components mentioned in the specification, such as by replacing the anionic detergent(s) with triethanolamine lauryl sulfate, sodium myristyl sulfate, potassium cetyl sulfate, triethanolamine myristyl diethoxy sulfate, sodium C_{14} paraffin sulfonate, ammonium C_{16} olefin sulfonate, or triethanolamine coco monoglyceride sulfate or mixtures thereof, replacing the polyethylene with higher or lower molecular weight polyethylenes within the 1,000 to 10,000 molecular weight range mentioned, such as Allied Signal's AC Polyethylenes 6A, 7A, 8A and 725, and Eastman Chemical Corporation's E-12, -14 and -43 (M.W's. of 1,800, 2,300 and 4,500), replacing the mineral oil with mineral oils of molecular weights of about 550 or of higher or lower molecular weights, up to 1,000 or down to 150, or replacing the cationic surfactant, at least in part, with distearyl dimethyl ammonium chloride, trilauryl methyl ammonium chloride, stearyl cetyl dimethyl ammonium chloride or dilauryl diethyl ammonium chloride, desired hair conditioning and cleaning effects are also obtainable, and are greater when the combination of polyethylene and mineral oil is present than when it is omitted. Also, in such compositions the various illustrated adjuvants or some of them may be present or may be omitted. Preferably, in addition to or in replacement of other optional conditioning agents mentioned there will be present an aminosilicone, such has been described in U.S. Patents

4,559,227, 4,563,347, 4,601,902, 4,704,272 and 4,749,732, and in the US application Serial No.432952 corresponding to EP Application No. Serial No. which are entitled "Fiber Conditioning Compositions Containing Aminosilicone Conditioning Agent" which are incorporated herein by reference. Preferably, the amount of such aminosilicone hair conditioning agent will be 0.05 to 3%, preferably 1 to 2%, on the shampoo formula basis. In the various conditioning composition formulas the proportions of components may also be changed, being increased or decreased by 10%, 20% and 30%, so long as they are retained within the ranges recited in the specification, and the mentioned improved conditioning effects are obtainable.

EXAMPLE 35

Component	Percent (by weight)				
	A	B	C	D	E
Part 1					
Deionized water	75.89	75.64	75.14	74.54	73.64
* Natrosol™ 250 HHR	0.45	0.45	0.45	0.45	0.45
** Natrosol 330 CS	0.15	0.15	0.15	0.15	0.15
Ammonium lauryl sulfate	12.50	12.50	12.50	12.50	12.50
Sodium lauryl diethoxy sulfate	2.50	2.50	2.50	2.50	2.50
Part 2					
*** C_{18-36} acid triglyceride	0.75	0.75	0.75	0.75	0.75
Ethylene glycol distearate	0.75	0.75	0.75	0.75	0.75
Stearyl stearate	0.35	0.35	0.35	0.35	0.35
Propylene glycol, U.S.P.	0.50	0.50	0.50	0.50	0.50
Lauric monoethanolamide	3.50	3.50	3.50	3.50	3.50
Tricetyl methyl ammonium chloride	0.50	0.50	0.50	0.50	0.50
Others					
**** Preservative (Gemaben II)	0.50	0.50	0.50	0.50	0.50
Dye (1% aqueous solution)	0.10	0.10	0.10	0.10	0.10
+ Sodium chloride	0.30	0.30	0.30	0.30	0.30
++ Citric acid	0.01	0.01	0.01	0.01	0.01
Dow-Corning™ Silicone "B"	0.75	1.00	1.50	2.00	3.00
Perfume	0.50	0.50	0.50	0.50	0.50
	100.00	100.00	100.00	100.00	100.00

* Hydroxyethyl cellulose (Hercules Corp.)

** Hydroxyethyl cellulose (Hercules Corp.)

*** Syncrowax™ HGC-L (mf'd. by Croda Corp.)

**** Mf'd. by Sutton Laboratories, Inc.

+ Sodium chloride (viscosity regulator, can be employed up to 0.5%, to increase shampoo viscosity).

++ pH adjuster, can be employed, up to 0.1%, to lower pH, or sodium citrate can be employed, up to 0.1%, to raise pH.

The shampoo of the invention is made by charging the formula amount of water to a primary mixing vessel, starting mixing, and slowly sprinkling in the formula amounts of the Natrosols. Mixing is continued until the Natrosols are dissolved, while the medium is being heated to about 50° C. Heating is continued until the temperature is in the range of 80 to 85° C., after which the heat is turned down and the mixing is continued. The formula amounts of ammonium lauryl sulfate and sodium lauryl diethoxy sulfate are then added. During the time that the Part 1 components are being prepared the Part 2 components, including C_{18-36} acid triglyceride, ethylene glycol distearate, stearyl stearate, propylene glycol, lauric monoethanolamide and tricetyl ammonium chloride, are either added separately or together to a separate container and are heated, with mixing, in such container until a uniform melt or solution is obtained at a temperature in the 80 to 85° C. range. With both Parts 1 and 2 at about the same elevated temperature, Part 2 is added to Part 1 in the main mixing vessel, with care being taken to avoid foam formation during admixing. After the admixing is completed the heat is turned off and mixing is continued for another ten minutes, after which the aminosilicone (Dow-Corning Silicone "B") is mixed in and mixing is continued for another ten minutes. When the mix is cooled to 39° C, the formula amounts of perfume, preservative and dye solution are added, with mixing, and sodium chloride and citric acid (or sodium citrate) are added in such amounts as are sufficient to bring the viscosity to about 4,000 centipoises at 25° C, and sodium chloride and citric acid (or sodium citrate) are then added if the viscosity is too low, outside the 4,000 to 6,000 centipoise range (measured on a Brookfield RVTD viscometer, with spindle No. 4, rotating at 20 r.p.m), and if the pH is off specification (although in some circumstances the pH may be as low as 5 or as high as 8).

After the manufacturing of products 35A,35B,35C,35D and 35/E, they are evaluated for hair conditioning properties, using standard dry combing and wet combing evaluation techniques, such as are described in our co-filed US application Serial no. corresponding to EP Application no. Serial no. entitled Fiber Conditioning Compositions Containing Solubilized Poly-Lower Alkylene. The results of such tests are shown in Table 1.

TABLE 1

Test	35/A	35/B	35/C	35/D	35/E
**** Evaluation for ease of wet combing	4-5	6-7	7-8	8-9	10-11
**** Evaluation for ease of dry combing	3-4	5-6	5-6	6-7	7-8

**** Evaluations are on a scale of 1-10, with 1 being minimum conditioning (maximum resistance to combings) and 10 being maximum conditioning (minimum resistance to combings).

The rating of 11 for Composition 35/E indicates conditioning and ease of wet combing that are better than what had theretofore been considered to be obtainable.

A control shampoo is made of the same formula as those of this example, with the exception that the aminosilicone is omitted and is replaced by water. Both wet combing and dry combing ratings for such

control shampoo are 1-2, which illustrate the great improvement in conditioning effect obtained and its dependence on the presence of the particular described aminosilicone. When other aminosilicones, such as Dow-Corning Silicones "C" and "D" of similar general formula but of higher charge density, and in some cases lower molecular weight, are substituted for the Silicone "B"significantly lower values in conditioning evaluations result. Also, when the formulas are modified by additions of microcrystalline wax (m.p. = 82° C.) and petrolatum, using 0.2 to 1% of micro-crystalline wax, such as 0.5%, and 0.2 to 1.5% of petrolatum, such as 0.7%, with water contents being decreased to compensate, dry combing ratings are increased significantly for such modifications of Compositions 35C, 35D and 35E More importantly, significantly less flyaway hair is observed for all of these hydrocarbon containing compositions.

EXAMPLE 36

Component	Percent (by weight)		
	A	B	C
Irradiated deionized water	73.73	73.93	73.23
Natrosol 250 HHR	0.37	0.45	0.45
Natrosol 330 CS	0.13	0.45	0.15
Ammonium lauryl sulfate	12.50	12.50	12.50
Sodium lauryl diethoxy sulfate	2.50	2.50	2.50
Microcrystalline wax (m.p. = 82° C.)	1.00	0.20	0.20
C_{18-38} acid triglyceride	0.75	0.75	0.75
Snow white petrolatum	1.00	0.20	0.20
Tricetyl methyl ammonium chloride	0.50	0.50	0.50
Ethylene glycol distearate	0.75	0.75	0.75
Propylene glycol, U.S.P.	0.50	0.50	0.50
Lauric monoethanolamide	3.50	3.50	3.50
Stearyl stearate	0.35	0.35	0.35
Others			
Dow-Corning Silicone "B"	1.00	2.00	3.00
Sodium chloride	0.10	0.10	0.10
Preservative	0.50	0.50	0.50
Citric acid	0.01	0.01	0.01
Dye solution (0.5% aqueous solution)	0.31	0.31	0.31
Perfume	0.50	0.50	0.50
	100.00	100.00	100.00

Compositions 36A,36B and 36C are made according to the procedures described in Example 35 and are tested according to the procedures also described therein. The products are stable shampoos, which can last a year or more under normal conditions without deteriorating or losing conditioning powers, and without separating or settling out of component materials. The three shampoos are each adjusted to be of a viscosity in the range of 3,500 to 4,000 centipoises at 25° C., with such adjustment being made by addition of sodium chloride to thicken the shampoo to the desired viscosity. Also, pH's thereof are in the range of 6 to 7, normally being about 6.5, with pH adjustment being effected by addition of citric acid and/or sodium citrate, as appropriate.

When the shampoos are employed to wash and simultaneously condition human hair, evaluations of such hair after washing and rinsing (and drying when appropriate) show that the products made are excellent conditioning shampoos. The ratings (on the same bases as described in Example 35) for wet combing and dry combing for both 36A and 36B are 9-10 and wet combing and drying combing ratings for 36C are both 10-11. Thus, these examples illustrate that when more of the special aminosilicones of this invention is utilized conditioning will be improved. Additionally, it is shown that when microcrystalline wax and petrolatum are present, a lesser proportion of the aminosilicone may be employed, and conditioning corresponding to that obtained from the composition containing more aminosilicone and less microcrystalline wax and petrolatum is achievable. Thus, it would be expected that even better conditioning than 10-11 would be obtained by further increasing the microcrystalline wax and petrolatum contents of Formula 36/C, but care should be taken to avoid any excessive waxy feel of the conditioned hair.

Another advantage of the present invention is that the invented shampoos, although containing significant proportions of very effective anionic detergent(s), do not prevent the deposition of the contained conditioning agents onto the hair or other fibers to be conditioned. Also, although the conditioning agents are substantive to the hair and are not removed from it by the anionic detergent(s) during shampooing, they do not tend to build up excessive deposits on the hair due to repeated shampooings of the hair with the conditioning shampoos, and do not thereby tend to make the hair objectionably greasy. In summary, the conditioning agents, particularly the aminosilicones, sufficiently adhere to the hair from aqueous solutions of the present shampoo components during shampooing but do not objectionably build up deposits on the hair that would tend to make it greasy or would otherwise adversely affect its physical properties.

EXAMPLE 37

Component	Percent (by weight)							
	A	B	C	D	E	F	G	H
Water (irradiated, deionized)	73.13	68.13	68.13	70.63	73.13	73.13	69.13	71.1
Natrosol 250 HHR	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.3
Natrosol 330 CS	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.1
Ammonium lauryl sulfate	15.00	-	-	2.50	-	-	12.50	12.5
Ammonium laurethoxy sulfate	-	20.00	-	-	-	7.50	-	-
Sodium laurethoxy (2 EtO) sulfate	-	-	-	-	-	7.50	2.50	2.5
Sodium alpha C_{12-16} olefin sulfonate	-	-	-	-	15.00	-	-	-
Cocoamidopropyl betaine	-	-	-	-	-	-	3.50	-
Sodium decethoxy (3 EtO) sulfate	-	-	20.00	15.00	-	-	-	-
Microcrystalline wax (m.p. = 82°C.)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
C_{18-36} acid triglyceride	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.7
Petrolatum (Snow white)	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.7
Tricetyl methyl ammonium chloride	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.5
Ethylene glycol distearate	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.7
Propylene glycol, U.S.P.	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.5
Lauric monoethanolamide	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.5
Stearyl stearate	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35

EXAMPLE 37 (cont'd.)

Component	Percent (by weight)							
Aminosilicone (Dow-Corning "B")	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
** Climbazole	-	-	-	-	-	-	-	0.50
*** Piroctone olamine	-	-	-	-	-	-	-	0.50
**** Zinc pyrithione	-	-	-	-	-	-	-	1.00
Sodium chloride	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Preservative (Germaben II)	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Sodium citrate	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Aqueous dye solution (1% concentration)	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
Perfume	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

* of 1-3 ethoxies, e.g., 2 EtO

** anti-dandruff agent, mf'd. by Bayer

*** anti-dandruff agent, mf'd. by Hoechst, as Octopirox

**** anti-dandruff agent, mf'd. by Olin Industries

EP 0 413 417 A2

Compositions A-H of this example are made by the procedure previously described in Examples 35 and 36. The various compositions made, all of which are within the present invention, all exhibit improved hair conditioning properties, including easier combing, better manageability, less flyaway (which is attributed in part to the presence of the microcrystalline wax and petrolatum in all the formulas), and repeated shampoolngs of the compositions do not leave objectionable gummy deposits on the hair, such as can result from employing cationic gum conditioners instead of the described aminosilicones.

EXAMPLE 38

Component	Percent (by weight)		
	A	B	C
Irradiated deionized water	73.63	73.53	73.13
Natrosol 250 HHR	0.37	0.45	0.45
Natrosol 330 CS	0.13	0.15	0.15
Ammonium lauryl sulfate	12.50	12.50	12.50
Sodium lauryl diethoxy sulfate	2.50	2.50	2.50
Microcrystalline wax (m.p. = 82° C.)	1.00	-	0.20
C_{18-36} acid trigiyceride	0.75	0.75	0.75
Petrolatum (white)	1.00	-	0.20
Tricetyl methyl ammonium chloride	0.50	0.50	0.50
Ethylene glycol distearate	0.75	0.75	0.75
Propylene glycol	0.50	0.50	0.50
Lauric monoethanolamide	3.50	3.50	3.50
Stearyl stearate	0.35	0.35	0.35
Dow-Corning Silicone "B"	1.00	3.00	3.00
Sodium chloride	0.20	0.20	0.20
Preservative (Germaben II)	0.50	0.50	0.50
Sodium citrate or citric acid	0.01	0.01	0.01
Aqueous dye solution (0.6% conc.)	0.31	0.31	0.31
Perfume	0.50	0.50	0.50
	100.00	100.00	100.00

The compositions of this example are made according to the method described in the previous examples and are evaluated in similar manner. The three shampoos made are effective conditioning shampoos of desired viscosity (4,000 centipoises at 25° C.) and pH (6.5). They are stable on storage and effectively condition hair that is shampooed with them. Shampoos 38B and 38C are more effective in improving ease of wet combing than Shampoo 38A but Shampoo 38A, despite the fact that it contains less aminosilicone than the other shampoos, is characterized by improved (excellent) dry combing properties. To make shampoo 38A even more acceptable to consumers the amount of petrolatum in the formula is decreased to 0.75%, to avoid any trace of greasiness in the shampooed hair, and improved and satisfactory conditioning (including superior dry combing ease) are still obtained.

EXAMPLE 39	
Component	Percent (by weight)
Deionized water	73.94
Natrosol 250 HHR	0.45
' Natrosol 330 AP	0.15
Ammonium lauryl sulfate	12.50
Sodium lauryl diethoxy sulfate	2.50
C_{18-36} acid triglyceride	0.75
Tricetyl methyl ammonium chloride	0.50
Ethylene glycol distearate	0.75
Propylene glycol	0.50
Lauric monoethanolamide	3.50
Stearyl stearate	0.35
Aqueous color solution (0.6% conc.)	0.31
Germaben II	0.30
Aminosilicone (Dow Corning Silicone "B")	3.00
Perfume	0.50
	100.00

' Hydroxyethyl cellulose (Hercules Corp.)

Shampoos of the above formula are made by the procedure previously described, using different aminosilicones, which shampoos are identified as A, B, C, D and E, and a basic control formula, F, is also made, containing no silicone (but with 3% more deionized water).

Table 2 below identifies the aminosilicones in the various formulas, when present, and Table 3 gives wet combing and dry combing evaluation data for such formulations.

TABLE 2

Formula Identification	Aminosilicone Identification	Amine Equivalent
39A	A	4,200
39B	B	30,000
39C	C	2,000
39D	D	2,000
39E	E	1,800
39F	F	

TABLE 3

Characteristic	Evaluation					
	39A	39B	39C	39D	39E	39F
Wet combing ease	4.5	8.5	2	1	1	2.5
Dry combing ease	4.0	8.0	2	2	2	2.0

Aminosilicone A is obtained from Dow-Corning Corporation and the molar percentage of the amine is about 0.125, the degree of polymerisation is about 800, x is 797, y is one, and the molecular weight is about 60,000 daltons.

From the above data it is seen that some aminosilicones have an adverse affect on hair conditioning or affect it hardly at all whereas those of the present invention, which are components of the A and B compositions, measurably improve conditioning (as measured by eases of wet and dry combing). Such compositions also improve manageability of the hair.

EXAMPLE 40

When, in variations of the formulations of the preceding examples, the various adjuvants are omitted from the formulas so that the shampoos made contain only the required constituents thereof, anionic surfactant(s), cationic surfactant conditioner(s) aminosilicone(s) and water, the preparations made are less viscous than is desirable for commercial shampoos but they are usefully employable for shampooing and conditioning hair. When hydrocarbon components, such as microcrystalline wax and petrolatum, or polyethylene and mineral oil, with paraffin and/or isoparaffin also being addable, are included in the formulations with the basic required components, conditioning is further improved, as was previously indicated.

In the various formulations of the examples other materials mentioned in the specification may be substituted in part for those recited in the examples and useful improvements in hair conditioning (and fiber conditioning) will be obtainable. Thus, triethanolamine lauryl sulfate, sodium myristyl sulfate, potassium cetyl sulfate, triethanolamine myristyl diethoxy sulfate, sodium C_{14} paraffin sulfonate, ammonium C_{16} olefin sulfonate or triethanolamine cocomonoglyceride sulfate, or mixtures thereof, may be employed as the anionic detergent component, and distearyl dimethyl ammonium chloride, trilauryl methyl ammonium chloride, stearyl cetyl dimethyl ammonium chloride or dilauryl diethyl ammonium chloride may be substituted for the cationic surfactant conditioning agent, and improved conditioning will also result. Similarly, various aminosilicones of the formula given and of the mentioned molecular weights and amine equivalents, which describe such polymers, may be employed in place of the specific preferred materials recited herein. Normally, however, it will be preferred to employ those wherein R^1, R^2, R^3, R^5, R^6 and R^7 are alkyls in the lower portion of the 1 to 6 carbon atoms range, such as of two carbon atoms or less and most preferably 1 carbon atom, and R^8 is an alkyl group having 3 to 6 carbon atoms with isobutyl being the preferred group. An important consideration in selecting the aminosilicone formulation is the feasibility and economy of its manufacture so the R and other alkyl substituents on the silicon atoms will often be identical, except for R^4. As to the adjuvants, different thickeners, viscosity controllers, foaming agents, foam modifiers, stabilizers, dispersing agents, preservatives, pH modifiers, etc. may be substituted for those of the examples, as described in the specification, without interfering with the improved conditioning obtainable.

Furthermore, the proportions of components of the compositions of the examples may also be changed, by being increased or decreased by 10%, 20%, 30%, so long as such proportions are retained within the ranges recited in the specification, and in which the mentioned improved conditioning effects are obtainable. Finally, instead of the compositions of the examples all being shampoos they may be employed for cleaning and conditioning other fibrous materials, such as cotton, wool and synthetic fibers, and the formulas may be modified by omission of anionic surfactants to produce non-detersive fiber and hair conditioning preparations that are useful for conditioning previously washed fibers (and which may be employed as hair rinses, mousses or gels to condition washed hair).

EXAMPLES41A to41C			
Component	Percent (by weight)		
	41A	41B	41C
Cetyl trimethyl ammonium chloride	1.0	1.0	1.0
*Petrolatum (Fonoline) (Registered Trade Mark)	-	-	0.5
Beeswax, natural yellow	-	0.5	-
Hydroxyethyl cellulose (thickener)	1.0	1.0	1.0
Cetyl alcohol	2.0	2.0	2.0
Sodium borate	-	0.07	-
Deionized water	96.0	95.43	95.5
	100.00	100.00	100.00

* contains 60% n-alkanes averaging in the range of 27 to 33 carbon atoms, with distribution curve peak in such range.

Analysis of natural yellow beeswax indicates it to typically contain 23% myricyl palmitate, 2% laceryl palmitate, 12% myricyl cerotate, and 2% myricyl hypogaete, i.e. 49% of esters of wax acids; and 0.3% pentacosane, 0.3% heptacosane, 1-3% nonacosane, 8-9% hentriacosane and 2.5% of melene, i.e. 12.1 to 15.1% of C_{25+} hydrocarbons.

EXAMPLES41D to41G				
Component	Percent (by weight)			
	41D	41E	41F	41G
Cetyl trimethyl ammonium chloride	1.0	1.0	1.0	1.0
*Petrolatum (Fonoline) (Registered Trademark)	0.25	-	0.5	0.25
Beeswax, natural yellow	0.25	0.5	-	-
Hydroxyethyl Cellulose (thickener)	1.0	1.0	1.0	1.0
Cetyl alcohol	2.0	2.0	2.0	1.0
Sodium borate	0.04	0.07	-	-
Deionized water	95.46	95.43	95.5	97.25
	100.0	100.0	100.0	100.0

*contains 60% n-alkanes averaging in the range of 27 to 33 carbon atoms, with distribution curve peak in such range.

Hair conditioning rinses of the above formulas were made by melting together the lipophilic components (cetyl trimethyl ammonium chloride, petrolatum, beeswax and cetyl alcohol) at 80° C. and emulsifying the melt into the balance of the formula in the aqueous medium, which is also at 80° C., after which the emulsion formed was cooled to room temperature over about 20 minutes for each formula. Standards tresses of human hair (3 grams per tress) were treated with one gram each of the conditioning rinses for one minute each, after which they were rinsed and subjected to wet combing. A panel of evaluators rated ease of wet combing on a scale of 1 to 5, from difficult to easy and 12 ratings were made for each tress, with average ratings being calculated for each. Subsequently, in separate tests, after rinsing of the tresses they were dried by blow drying and were combed. Using the same scale, the ease of combing was again evaluated by the panel, and averages were calculated. The following table summarizes such averages.

TABLE 4

Types of combing	Averages (ease of combing)						
	A	B	C	D	E	F	G
Wet	2.52	4.50	4.25	5.15	4.25	4.20	4.10
Dry	2.98	4.75	4.21	4.25	4.52	4.22	4.17

From the resuts of these experiments it is apparent that the presences of the WDC's in the compositions of the present invention substantially increased the ease of combing, which is considered to be closely related to overall manageability and conditioning, of human hair tresses treated with the compositions of the present invention, compared to a control comosition (41A) which did not contain such a WDC. In the experiments reported the best results (best conditioning) were obtained from Experiment 41B, in which the sole WDC is beeswax, but the formula of Experiment 41D yields satisfactory results and is economically advantageous, compared to that of 41B. In vivo tests (actual use tests on "living" hair) verify such results, as do other in vitro tests wherein the tresses are contacted with diluted rinse emulsion (diluted 1:1, 1:2 and 1:3, composition:water).

In similar tests when a mineral oil was employed in place of the WDC's measurably poorer conditioning resulted and sometimes the tresses were noticeably oily, which is usually objectionable. The tresses of Formulas 41A-41G were not oily after treatment. When carnauba wax is employed in place of the WDC's the hair conditioning effect is inferior to the effects of the compositions of the present invention, due to its aromatic compounds' content, but microcrystalline wax is operative.

Although at the present time the costs of such cationic surfactants are prohibitive, by employing heptacosyl trimethyl ammonium chloride or hentriacosyl trimethyl ammonium chloride at 1% or 0.5% concentration in place of cetyl trimethyl ammonium chloride in the present formulas, without any of the named WDC's, those cationic surfactants will also act as WDC's, and the hair conditioning effects will be improved, as in the reported experimental formulas.

In other variations of the formulas of this example the cetyl trimethyl ammonium chloride is replaced by cetyl trimethyl ammonium bromide or with lauryl trimethyl ammonium chloride, the cetyl alcohol is replaced by myristyl alcohol and the petrolatum is replaced by a C_{25} paraffin, and comparable similar improved results are obtained. Also, the proportion of cetyl alcohol to cetyl trimethyl ammonium chloride may be varied in the range of 3:1 to 1:1 from the 2:1 of the examples, and the desired lubricating effect of the cetyl alcohol will still be obtained.

EXAMPLES42A to42C			
Components	Percent (by weight)		
	42A	42B	42C
Ammonium lauryl sulphate	7.5	12.5	12.5
Ammonium laureth sulphate (2EtO)	7.5	-	
Sodium laureth sulphate (2EtO)	-	2.5	1.5
Lauramide MEA	1.5	2.0	2.0
Cetyl alcohol	1.0	-	-
Stearyl stearate	-	0.35	0.35
Ethylene glycol distearate	0.5	0.75	0.50.75
Propylene glycol	1.0	0.5	0.5
Tricetyl methyl ammonium chloride	1.0	0.5	0.5
*Petrolatum	-	0.5	0.5
Beeswax (natural yellow)	-	0.25	0.2
Xanthan gum	-	-	-
Sodium chloride	1.0	1.5	1.5
Preservative (Gemeben II)	0.5	0.4	0.5
Perfume	0.5	0.5	0.4
Deionized water	78.0	77.75	77.8
	100.0	100.0	100.0

EXAMPLES42D to42G				
Components	Percent (by weight)			
	42D	42E	42F	42G
Ammonium lauryl sulphate	12.5	7.5	7.5	15.0
Ammonium laureth sulphate (2EtO)	-	7.5	7.5	3.0
Sodium laureth sulphate (2EtO)	2.5	-	-	-
Lauramide MEA	2.0	0.75	1.5	2.0
Cetyl alcohol	-	0.5	2.0	0.5
Stearyl stearate	0.35	-	-	-
Ethylene glycol distearate	0.75	0.5	0.5	-
Propylene glycol	0.5	0.5	1.0	-
Tricetyl methyl ammonium chloride	0.5	0.5	1.0	0.5
*Petrolatum	0.5	0.25	-	-
Beeswax (natural yellow)	0.15	0.25	0.4	2.5
Xanthan gum	-	-	-	0.3
Sodium chloride	1.5	1.0	1.0	-
Preservative (Gemeben II)	0.5	0.5	0.5	0.5
Perfume	0.4	0.4	0.5	0.5
Deionized water	77.85	79.85	76.6	75.2
	100.0	100.0	100.0	100.0

*contains 60% n-alkanes averaging in the range of 27 to 33 carbon atoms, with distribution curve peak in such range.

The control emulsion (A) and the emulsions of the present invention (B-G) were all made by the method described in Example 41 and were tested in the same manner. In addition, the evaluators listed their general impressions as to the conditioning of the hair (included in which were considerations of manageability, appearance and feel), as well as wet and dry combing evaluations. Such ratings are given in Table 5 below.

TABLE 5

Evaluation	Average						
	A	B	C	D	E	F	G
Conditioning	None	*Exc	Exc	Exc	Good	Exc	Exc
Wet combing ease	1.0	4.0	3.5	3.3	3.0	3.0	5.0
Dry combing ease	1.0	4.0	3.5	3.3	3.0	3.0	5.0

*Excellent

From the data presented above it is evident that significant improvement in the conditioning of human hair result from the presence in shampoo formulations of small proportions of the WDC's of this invention together with cationic surfactant hair conditioning compound (quatenary ammonium halide), and such improved conditioning is evidently due to the presence of the WDC because control formula 42A which contains no WDC, but does contain the cationic conditioning agent, is very much inferior in conditioning effect to compositions 42B-G, all of which are within the present invention. The results described are verified by in vivo tests, which are ordinary shampooings of hair on the head with the described compositions.

In variations of the formulas tested there may be substituted for the described detergent systems those wherein the active detergent components are any of triethanolammonium lauryl sulphate, ammonium olefin sulphonates, ammonium C_{12-18} paraffin sulphonates, or mixtures therof, and nonionic and amphoteric detergents may also be present in such compositions. The cationic surfactant conditioning agent may also be varied, as in Example 41, the WDC may be obtined from other materials, including montan and candelilla waxes, synthetic beeswax and Japan wax, and microcrystalline waxes may be incorporated in the compositions, too. Similarly, the WDC's may be pure compounds, such as hydrocarbons, alcohols, carboxylic acids and carboxylic esters, or of fractions of sources of WDC's, such as beeswax, and may be alcohols, amines, amine salts and quaternary ammonium salts of such hydrocarbons, and amides of such carboxylic acids, and the shampoo compositions resulting will also be of improved hair conditioning activities. The WDC's may be those available from certain petrolatums, paraffins and beeswax. The purified components of beeswax, include nonacosane, melissic acid, myricyl cerotate, and n-hentriacontanyl trimethyl ammonium chloride, nonacosyl amine and melissamide, may be considered as derivatives of such purified components. In a further variation of the shampoo formulas a relatively small percentage of nonionic detergent, such a higher fatty alcohol polyethoxylate, like Neodol (Registered Trade Mark) 25-3, 23-6 or 25-7 may be present, in addition to the anionic detergent (to improve removal of oil and previously deposited conditioning agents from hair and scalp). Normally from 1 to 10% of such nonionic detergent may be present, preferably 2 to 5%, e.g. about 3%.

EXAMPLES43A to43C

Component	Percent (by weight)		
	A	B	C
Distearyl dimethyl ammonium chloride	6.0	6.0	3.0
**Amine citrate complex	-	-	3.0
Beeswax (yellow)	-	0.5	0.5
*Petrolatum	-	0.1	0.1
Sodium citrate	0.05	0.05	-
Propylene glycol	0.1	0.1	0.1
Deionized water	93.85	93.25	93.3
	100.0	100.0	100.0

* contains 60% n-alkanes averaging in the range of 27 to 33 carbon atoms, with its distribution curve peak in such range

** pre-made complex obtained by mixing distearyl methyl amine and citric acid in a molar ratio of 1:1

The wash cycle and rinse cycle fabric conditioning compositions of this example, which are useful for the treatmeent of laundry, usually in an automatic washing machine, are made by following the procedure described in Example 41 with the lipophilic materials being melted together and being admixed with the hydrophilic components in the aqueous medium, and being cooled to room temperature.

The control (43A) and the compositions of the present invention (43B and 43C) are each tested in wash cycle and rinse cycle applications, using different commercial detergents at the concentrations in the wash waters that were suggested by the manufacturers thereof. In the wash cycle tests the wash water is of a hardness of about 125 p.p.m., as $CaCO_3$ and is at a temperature of 32° C, the fabric load is large, the wash time is fourteen minutes and the rinse is cold. The commercial detergents to which the wash cycle additive are added are TIDE (Registered Trademark) powder (with phosphate builder), FRESH START (Registered Trade Mark) liquid TIDE, and liquid WISK (Registered Trade Mark, and the concentrations of the wash cycle additive in the wash water are varied so that from about 4 to 9% of conditioning components are present therein, based on the detergent composition employed (or 75 to 150 g. of conditioning composition per 68 litres of wash water, which is 0.1 to 0.2%). The test items, which are mixed in with an ordinary fabric ballast load of five pounds of mixed fabric types, include cotton, nylon tricot, Dacron (Registered Trade Mark) single knit, Dacron double knit, 65/35 Dacron/cotton blends and Banlon (Registered Trade Mark) swatches (for static pick-up evaluations), plus terrycloth hand towels, for softness evaluations. The washed materials are dried for 60 minutes, using the heavy, high setting of an automatic laundry dryer, and the entire washing and drying operations are repeated twice, after which the test fabrics are evaluated for static cling (synthetics) and softness (terrycloth towels.) The evaluation for static cling is conducted immediately after the dryer has been shut off after the third drying. The humidity in the test room is in the range of 44 to 56% R.H. for both static and softness tests. The terrycloth towels are hung on a clothes rack after being removed from the dryer and are allowed to remain there for about twelve hours before being evaluated for softness.

At all concentrations of the active conditioning components that were tested and in washing the test fabrics with all of the detergent compositions in wash water containing the 43B and 43C wash cycle additives, less static cling was noted that when composition 43A was employed. The differences in cling are apparent to even a casual observer. With respect to fabric softness, the results are similarly favorable to the compositions of the present invention, both when evaluations are conducted by an expert of long experience in such techniques, and when observations are made by unskilled observers.

A very important result that was observed is that employment of the compositions of the present invention as wash cycle softeners results in even better fabric softening and less static cling than that which results when a commercial rinse cycle softener (Downy) (Registered Trade Mark) in an amount of equal active conditioning ingredient content, is employed as a wash cycle additive.

In rinse cycle applications, utilizing the same procedure, except for utilizing only one washing operation and one drying, the same types of results are obtained.

A theory that has been advanced to explain the superiority of the detergent compositions of the present invention over controls and over the commercial fabric softener in wash cycle applications is that applicants' WDC acts to "protect" the cationic surfactant from reaction with the anionic compounds in the wash water, allowing it to exert its full fabric conditioning capabilities. Such theory is supported by measurements of specific conductances and Zeta potentials of the experimental and control compositions, and turbidity measurements of the compositions of the present invention and controls in wash waters containing commercial anionic detergent compositions, but is not relied on herein.

In variations of the examples given the various components, other than cationic surface active conditioning agent and WDC, may be omitted, and the results reported will be essentially the same. Also, the different cationic components and sources of WDC's previously mentioned in the specification and in the other working examples may be substituted for those of Example 43, and similar significant differences in fabric softening and in antistatic action, in favour of the compositions of the present invention will be obtained. Thus, for example, mono-higher alkyl tri-lower alkyl ammonium halides and tri-higher alkyl mono-lower alkyl ammonium haides may be employed, as may be others of the WDC's previously mentioned.

EXAMPLES44A and44B

Component	Percent (by weight)	
	A	B
Sodium linear dodecylbenzene sulphonate	5.0	5.0
Sodium sulphate (accompanying anionic detergent)	1.7	1.7
**Neodol 25-7	15.0	15.0
Distearyl dimethyl ammonium chloride	6.0	6.0
*Petrolatum	-	0.5
Citric acid (50% aqueous solution)	9.0	9.0
Triethanolamine	0.3	0.3
Formalin	0.2	0.2
Fluorescent brightener (Tinapol) (Registered Trademark SBM, Extra conc.)	0.2	0.2
Colorant (0.5% aqueous solution)	1.0	1.0
Perfume	0.4	0.4
Deionized water	61.2	60.7
	100.0	100.0

*contains 60% n-alkanes having in the range of 27 to 33 carbon atoms, with distribution curve peak in such range.

** Nonionic detergent, which is a condensation product of a mole of fatty alcohol of 12-15 carbon atoms with seven moles of ethylene oxide.

A control softergent composition (44A) and the composition of the present invention (44B) are both employed to wash both cotton and synthetic test fabrics, following the procedure described in Example 43, with only a single washing and drying, and the fabrics are subsequently evaluated for static cling and softness by the methods described in Example 43. The results obtained are also like those reported in Example 43 for wash cycle fabric conditioning compositions, which is as expected because the present softergent composition produces substantially the same type of wash water as results from addition of the corresponding wash cycle conditioning composition to a wash water containing detergent composition. As in Example 43, when multiple washings and dryings of the test fabrics are practiced the improved conditioning effects, which are in fovour of the present invention are enhanced.

In modifications of the composition formula the detergent component may be all anionic or all nonionic, and the anionic and nonionic detergents may be replaced with others previously described in these examples and in the foregoing specification, the distearyl dimethl ammonium chloride may be replaced by other quaternary ammonium salts, such as those previously referred, or by other amine and quaternary ammonium complexes, such as those previously mentioned. Also, the WDC may be replaced by other WDC's of the types that had been earlier described. Such a change or such a plurality of changes still results in compositions of the present invention which will be of improved fabric conditioning properties, including softening and/or antistatic properties, compared to control compositions which do not contain the required WDC. Another advantage of the invention is that the various WDC's are all safe to employ in the described proportions (many having already been accepted or approved for oral ingestion) and so do not require toxicity testing and governmental clearances.

EXAMPLE 45

In the formulas and compositions described in the previous examples variations of the components may be made by replacement of one or more of them with others described in the specification as equivalents or substitutes. The proportions of components may be varied, usually 10%, 20% and 50%, providing that they remain within the ranges recited ir the specification. Liquid compositions may be converted to particulate solids by replacement of water with particulate carrier materials, such as builders and fillers. In some instances it may be desirable separately to add to the wash or rinse waters the fused mixture of cationic surfactant fibre conditoning agent and WDC, preferably in liquid form either melted or in an

appropriate organic solvent, such as isopropanol, or mixed in with a powdered carrier. The individual cationic surfactant fibre conditioning agent and WDC may also be added to the wash waters or rinse waters but, as had previously been indicated, the desirable fibre conditioning effects will not be obtained from such a mere mixture to as great an extent as when such components are first fused together. Furthermore, it is highly preferable that they should be in emulsion form when charged to the wash and rinse waters. In an extension of the invention, on which work is now pending, the various WDC's, including those which are quaternary ammonium salts, are employed to promote deposition on or sorption by substrates, such as hair or laundry fibres, of relatively insoluble materials, such as fluorescent brighteners, colorants, perfumes, soil release promoting polymers, fungicides, bactericides, insect repellents, soil repellents and crease-proofing chemicals, which may be incorporated in appropriate rinses, additives and detergent compositions.

According to broader aspects of the present invention a hair conditioning shampoo of improved hair conditioning properties due to the content of C_6, C_8 and/or C_{10} alkyl sulfate and/or C_6, C_8 and/or C_{10} alkyl lower alkoxy sulfate therein instead of other anionic detergent, comprises an anionic detergent which is a C_6, C_8 and/or C_{10} alkyl sulfate and/or a C_6, C_8 and/or C_{10} alkyl lower alkoxy sulfate, a hair conditioning agent and an aqueous medium, which may include adjuvants and other components of such shampoos.

The proportions of the total of the C_6, C_8 and/or C_{10} alkyl sulfate and C_6, C_8 and/or C_{10} alkyl lower alkoxy sulfate, the hair conditioning agent and the aqueous medium are preferably in the range of 0.5 to 25%, 0.5 to 10% and 34 to 99%, respectively.

The hair conditioning shampoo of the invention may be in liquid, emulsion or dispersion form.

It may be made pearlescent and of improved stability by having a content of a long chain alkyl-containing compound which is an alcohol, a lower alkoxylated alcohol, an acid or an ester, containing a hydrocarbon chain of an average of 24 to 45 carbon atoms, or of any mixture of such compounds, preferably present in an amount of 0.5 to 10%.

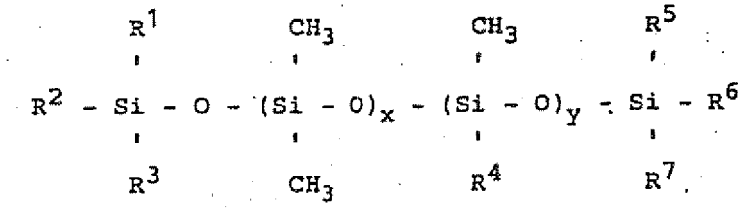
A shampoo of the invention preferably comprises 0.2 to 30% of a cationic conditioning agent which is preferably a quaternary ammonium salt or an amine salt.

At least one other water insoluble conditioning agent is desirably present, and preferably is selected from the group consisting of silicones, polyethylenes, paraffins, isoparaffins, petrolatums, microcrystalline waxes, C_{18-36}(mixed) fatty acids and/or triglycerides, stearyl stearate, beeswax and mixtures thereof.

The percentage of water in the composition is preferably in the range of 60 to 90%.

In broader aspects of the invention a hair conditioning composition comprises any compatible combination of two or more ingredients selected from a C_6, C_8 and/or C_{10} alkyl sulfate and/or a C_6, C_8 and/or C_{10} alkyl lower alkoxy sulfate, a long chain saturated primary alcohol or a derivative thereof of an average of 24 to 45 carbon atoms in such long chain, a water insoluble conditioning agent, a silicone, a quaternary ammonium salt, an amine, an anionic/cationic surfactant complex, a polyalkylene, an oxidized polyalkylene, a paraffin, an isoparaffin, a petrolatum, a microcrystalline wax, a C_{18-36} fatty acid triglyceride, a C_{18-36} fatty acid, stearyl stearate or beeswax.

The cationic conditioning agent is preferably a quaternary ammonium salt of the formula R^9, R^{10}, R^{11}, R^{12}, N^+ X^-, wherein R^9 is lower alkyl of 1 to 4 carbon atoms, R^{10} and R^{11} are higher alkyls of 10 to 40 carbon atoms, R^{12} is such a lower alkyl or such a higher alkyl and X^- is a salt forming ion. The water insoluble conditioning agent preferably includes an aminosilicone of the formula



wherein R^1, R^2, R^3, R^5 and R^7 are alkyls of 1 to 6 carbon atoms, R^4 is $-R^8-NH-CH_2CH_2-NH_2$, R^8 is an alkylene of 3 to 6 carbon atoms, x is an average number in the range of 100 to 10,000 and y is an average number in the range of 0 to 10, e.g. 1 to 8, the aminosilicone being of an amine equivalent in the range of 4,000 to 60,000.

A long chain alkyl-containing compound is preferably present, which is preferably a long chain alcohol or a long chain lower alkoxylated alcohol preferably of an average of about 30 to 40 carbon atoms in the long chain alkyls thereof; such alkyls are preferably of even numbers of carbon atoms, and such alcohols are preferably of substantially bell-shaped distribution curves (% by weight vs. chain length).

The alkyl lower alkoxy sulfate is preferably an alkyl polyethoxy sulfate of 1 to 6 ethoxy groups. The quaternary ammonium salt is preferably one in which X is chlorine and R^{10} and R^{11} are alkyls of 12 to 20 carbon atoms. Preferably a quaternary ammonium salt, a long chain alcohol and/or an alkoxylated long chain alcohol, an alkyl sulfate and/or an alkyl polyethoxy sulfate and a water insoluble conditioning agent are present, the proportions of the total of the C_6, C_8 and/or C_{10} preferably C_{10} alkyl sulfate and C_6, C_8 and/or C_{10} preferably C_{10} alkyl polyethoxy sulfate, the cationic conditioner, the water insoluble conditioning agent, the long chain alcohol and/or the alkoxylated long chain alcohol and water are in the ranges of 5 to 25%, 0.1 to 5%, 0.5 to 5%, 0.5 to 10% and 65 to 85%, respectively. The shampoo of the invention may comprise 0 to 20% of anionic detergent that is of an alkyl chain of more than 10 carbon atoms.

A shampoo of the invention may comprise 0.5 to 5% of a long chain alkyl-containing alcohol and/or alkoxylated such alcohol, which is/are preferably of an average of 24 to 45 carbon atoms in the alkyl groups thereof.

A shampoo of the invention may comprise 5 to 25% of anionic detergent, of which preferably at least 1/4, on a total composition basis, is C_6, C_8 and/or C_{10} alkyl sulfate, and/or C_6, C_8 and/or C_{10} alkyl ethoxy sulfate of 2 to 6 ethoxy groups per mole or a mixture thereof. It preferably contains quaternary ammonium halide, e.g. 0.3 to 2%, which preferably is a mixture of distearyl dimethyl ammonium chloride and tricetyl methyl ammonium chloride, preferably in a ratio in the range of 0.3:1 to 3:1. It preferably contains microcrystalline wax e.g. 0.5 to 3%. It preferably contains petrolatum e.g. 0.5 to 3%. It preferably contains stearyl stearate, e.g. 0.2 to 2%. It preferably contains $C_{18-36(mixed)}$ acid triglyceride, e.g. 0.3 to 5%. It preferably also contains water, e.g. 65 to 80%.

A shampoo of the invention may comprise hydroxyethyl cellulose e.g. 0.2 to 2% and preferably lauric monoethanolamide or cocodiethanolamide, e.g. 2 to 5%.

The invention has been described with reference to illustrations and examples thereof but is not intended to be limited to these because it is evident that one of skill in the art, with the present specification before him or her, will be able to utilize substitutes and equivalents without departing from the invention.

Claims

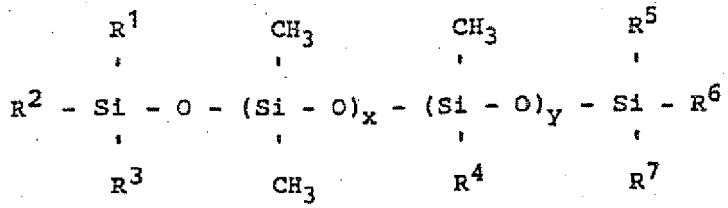
1. A hair conditioning shampoo of improved hair conditioning properties due to the content of C_6, C_8 and/or C_{10} alkyl sulfate and/or C_6, C_8 and/or C_{10} alkyl lower alkoxy sulfate therein instead of other anionic detergent, which comprises an anionic detergent which is a C_6, C_8 and/or C_{10} alkyl sulfate and/or a C_6, C_8 and/or C_{10} alkyl lower alkoxy sulfate, a hair conditioning agent and an aqueous medium, which may include adjuvants and other components of such shampoos.

2. A hair conditioning shampoo as claimed in Claim 1 characterised in that the proportions of the total of the C_6, C_8 and/or C_{10} alkyl sulfate and C_6, C_8 and/or C_{10} alkyl lower alkoxy sulfate, the hair conditioning agent and the aqueous medium are in the range of 0.5 to 25%, 0.5 to 10% and 34 to 99%, respectively.

3. A hair conditioning shampoo as claimed in Claim 1 or Claim 2 characterised in that it is in liquid, emulsion or dispersion form and is pearlescent and of improved stability due to its content of a long chain alkyl-containing compound which is an alcohol, a lower alkoxylated alcohol, an acid or an ester, containing a hydrocarbon chain of an average of 24 to 45 carbon atoms, or of any mixture of such compounds, preferably present in an amount of 0.5 to 10%.

4. A hair conditioning shampoo as claimed in Claim 1, 2 or 3 characterised in that it comprises 0.2 to 30% of a cationic conditioning agent which is a quaternary ammonium salt or an amine salt, and in which at least one other water insoluble conditioning agent is present, which is selected from the group consisting of silicones, polyethylenes, paraffins, isoparaffins, petrolatums, microcrystalline waxes, C_{18-36}(mixed) fatty acids and/or triglycerides, stearyl stearate, beeswax and mixtures thereof, and the percentage of water in the composition is preferably in the range of to 90%.

5. A shampoo as claimed in Claim 4 characterised in that the cationic conditioning agent is a quaternary ammonium salt of the formula R^9, R^{10}, R^{11}, R^{12}, N^+, X^-, wherein R^9 is lower alkyl of 1 to 4 carbon atoms, R^{10} and R^{11} are higher alkyls of 10 to 40 carbon atoms, R^{12} is such a lower alkyl or such a higher alkyl and X^- is a salt forming ion, the water insoluble conditioning agent includes an aminosilicone of the formula



wherein R^1, R^2, R^3, R^5 and R^7 are alkyls of 1 to 6 carbon atoms, R^4 is $-R^8 - NH - CH_2CH_2 - NH_2$, R^8 is alkylene of 3 to 6 carbon atoms, x is an average number in the range of 100 to 10,000 and y is an average number in the range of 0 to 10, e.g. 1 to 8, the aminosilicone being of an amine equivalent in the range of 4,000 to 60,000, and a long chain alkyl-containing compound is present, which is a long chain alcohol or a long chain lower alkoxylated alcohol of an average of about 30 to 40 carbon atoms in the long chain alkyls thereof, in which such alkyls are of even numbers of carbon atoms, and which alcohols are of substantially bell-shaped distribution curves (% by weight vs. chain length).

6. A shampoo as claimed in any one of Claims 1 to 5 characterised in that the alkyl lower alkoxy sulfate is an alkyl polyethoxy sulfate of 1 to 6 ethoxy groups, the hair conditioner is a cationic conditioner which is a quaternary ammonium salt in which X is chlorine and R^{10} and R^{11} are alkyls of 12 to 20 carbon atoms, a long chain alcohol and/or an alkoxylated long chain alcohol is present, the proportions of the total of the C_6, C_8 and/or C^{10} preferably C^{10} alkyl sulfate and the C_6, C_8 and/or C^{10} preferably C^{10} alkyl polyethoxy sulfate, the cationic conditioner, the water insoluble conditioning agent, the long chain alcohol and/or the alkoxylated long chain alcohol and water are in the ranges of 5 to 25%, 0.1 to 5%, 0.5 to 5%, 0.5 to 10% and 65 to 85%, respectively, and the said shampoo comprises 0 to 20% of anionic detergent that is of an alkyl chain of more than 10 carbon atoms.

7. A shampoo as claimed in Claim 6 characterised in that it comprises 0.5 to 5% of a long chain alkyl-containing alcohol and/or alkoxylated such alcohol, which is/are of an average of 24 to 45 carbon atoms in the alkyl groups thereof.

8. A shampoo as claimed in any one of Claims 1 to 7 characterised in that it comprises 5 to 25% of anionic detergent, of which at least 1/4, on a total composition basis, is C_6, C_8 and/or C_{10} alkyl sulfate, C_6, C_8 and/or C_{10} alkyl ethoxy sulfate of 2 to 6 ethoxy groups per mole or a mixture thereof, 0.3 to 2% of quaternary ammonium halide, which is a mixture of distearyl dimethyl ammonium chloride and tricetyl methyl ammonium chloride, in a ratio in the range of 0.3 to 3, 0.5 to 3% of microcrystalline wax, 0.5 to 3% of petrolatum, 0.2 to 2% of stearyl stearate, 0.3 to 5% of $C_{18-35(mixed)}$ acid triglyceride, and 65 to 80% of water.

9. A shampoo as claimed in any one of Claims 1 to 8 characterised in that it comprises 0.2 to 2% of hydroxyethyl cellulose and 2 to 5% of lauric monoethanolamide or cocodiethanolamide.

10. A process for shampooing and conditioning hair which comprises applying to human hair, on the head, a shampooing and conditioning proportion of a shampoo as claimed in any one of Claims 1 to 9 which contains a conditioning agent, and rinsing the shampoo from the hair, thereby leaving on the hair a conditioning amount of conditioning agent.

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(71) Applicant: Colgate-Palmolive Company
300 Park Avenue
New York, N.Y. 10022-7499(US)

(72) Inventor: Hartnett, Donna A.
30 Pullman Loop
Dayton, New Jersey(US)
Inventor: Patel, Amrit M.
35 Wetherhill Way
Dayton, New Jersey(US)
Inventor: Reich, Charles
257 Karsey Street
Highland Park, New Jersey(US)
Inventor: Robbins, Clarence R.
1726 Woodfield Road
Martinsville, New Jersey(US)

(74) Representative: Kearney, Kevin David
Nicholas et al
KILBURN & STRODE 30 John Street
London, WC1N 2DD(GB)

(54) Hair conditioning shampoo.

(57) A hair conditioning shampoo is described, which contains C_6, C_8 and/or C_{10} alkyl sulfate and/or C_6, C_8 and/or C_{10} alkyl lower alkoxylate sulfate as an anionic detergent component, a water insoluble conditioning agent(s) from the group of silicones (preferably a certain type of aminosilicone), polyethylenes, paraffins, isoparaffins, microcrystalline waxes, $C_{18-36(mixed)}$ fatty acids or such triglycerides, high fatty alcohol esters of a high fatty acid (such as stearyl stearate), beeswax, cationic conditioning agent, such as a quatenary ammonium or any mixture thereof, and a stablilizer for the shampoo, in water. Among adjuvants that may be present are lauric monoethanolamide, cocodiethanolamide, and hydroxyethyl cellulose, other thickeners and viscosity modifiers, pH adjusting agents, antioxidants, perfumes and colorants. The presence of the C_6, C_8 and/or C_{10} alkyl sulfate and/or C_6, C_8 and/or C_{10} alkyl lower alkoxylated sulfate surprisingly improves conditioning of the hair, compared to shampoos containing other detergents that contain longer chain alkyl groups.

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EUROPEAN SEARCH REPORT

Application Number

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DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
D,Y	GB-A-2 193 871 (COLGATE PALMOLIVE CO.) * Whole document *	1,4,10	A 61 K 7/08 A 61 K 7/06
Y	EP-A-0 314 141 (KAO CORP.) * Page 5, lines 15-37; page 7, line 41 - page 9, line, 10; claims 1-3 *	1,4,10	
D,Y	EP-A-0 208 533 (THE PROCTER & GAMBLE CO.) * Page 3, line 15 - page 8, line 19; examples I-VI *	1,4,10	
A	EP-A-0 294 894 (THE PROCTER & GAMBLE CO.) * Claims 1-3,7 *	1-10	
D,A	US-A-4 728 457 (THE PROCTER & GAMBLE CO.) * Whole document *	1-10	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

A 61 K

The present search report has been drawn up for all claims

Place of search	Date of completion of search	Examiner
The Hague	29 May 91	BERTOCCHI C.

CATEGORY OF CITED DOCUMENTS

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